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STIGMAPHYLLON (MALPIGHIACEAE) IN MEXICO, CENTRAL AMERICA, AND THE WEST INDIES

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INTRODUCTION

Stigmaphyllon, one of the wing-fruited genera of Malpighiaceae, includes approximately 100 species and occurs from eastern Mexico and the West Indies to northern Argentina. The plants typically are vines with long-petioled, cordate to elliptical leaves and clusters of yellow flowers borne in compound inflorescences. The androecium consists of ten usually unequal stamens. In most species the three styles bear lateral appendages, the folioles, for which the genus is named. The samaras have a large dorsal wing and often smaller lateral winglets or crests.

The geographic area considered in this paper includes eastern and southern Mexico, Central America, and the West Indies excluding Trinidad and Tobago. Most of the species occur at elevations of less than 2000 m. Two exceptions are *S. pseudopuberum* and *S. cordatum,* which have been also recorded at or above 2500 m. Of the twenty-four species treated here, seven (*S. angulosum, S. diversifolium, S. emarginatum, S. floribundum, S. laciniatum, S. microphyllum, S. sagraeanum*) are endemic to the West Indies and eight (*S. adenophorum, S. cordatum, S. lindenianum, S. panamense, S. pseudopuberum, S. retusum, S. selerianum, S. tonduzii*) to Mexico and Central America. The remaining nine occur in South America as well. Of these, four (*S. ciliatum, S. ellipticum, S. ovatum, S. puberum*) are found in Mexico, Central America, and the West Indies, and three (*S. columbicum, S. humboldtianum, S. hypargyreum*) only in Costa Rica and Panama. *Stigmaphyllon adenodon* and *S. convolvulifolium* are known in our area from only a few records in the southern Lesser Antilles. For a geographical listing by country or island(s) see the appendix.

Two-thirds of our species are easily recognized. The rest have been the source of some taxonomic confusion, especially for workers who saw only few, often poor specimens. In the West Indies, the widespread *S. diversifolium* and *S. emarginatum* are bewilderingly variable in leaf shape, which is reflected by the many names published to recognize this diversity. The laminas of *S. sagraeanum* also vary but fewer synonyms exist for this species, perhaps because it is restricted to Cuba and the Bahamas.

The assemblage of superficially similar plants from Mexico and Central America for which the names *S. lindenianum* and *S. humboldtianum* have been used, often indiscriminately, proved to include five species. Two are newly described here and are known from limited areas, *S. panamense* from central Panama and the islands in the Gulf of Panama and *S. tonduzii* from northern Costa Rica. *Stigmaphyllon humboldtianum* is a species of northern Colombia and adjacent Venezuela, which extends into Darién, Panama; it is sometimes cited by the illegitimate name *S. tiliifolium.* The remaining two species have wide ranges in

Mexico and Central America and are sympatric to some extent. *Stigmaphyllon lindenianum,* whose leaves bear straight and tightly appressed hairs below, is found throughout the Atlantic lowlands from Veracruz, Mexico, to Panama; it also occurs on the Pacific side of southernmost Costa Rica (on the Osa peninsula) and of Panama. The neglected name *S. retusum* applies to plants whose leaves bear T-shaped hairs below and which occur from Veracruz and immediately adjacent Puebla, Mexico, to Nicaragua. Both *S. lindenianum* and *S. retusum* have pubescent anthers. *Stigmaphyllon humboldtianum,* the species with which *S. retusum* and to a lesser extent also *S. lindenianum* have been most often confused, also has the leaves with T-shaped hairs below but has glabrous anthers.

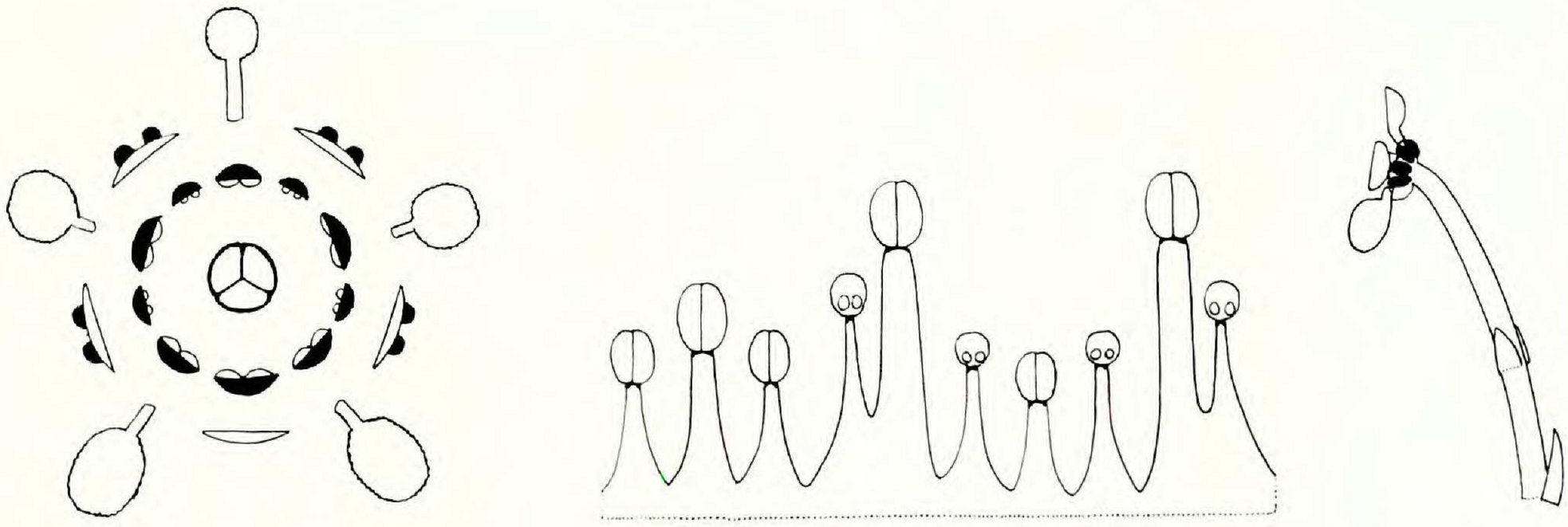
MORPHOLOGY

Vesture. As in all Malpighiaceae, the hairs are unicellular. If the hairs are sessile, the pubescence is termed sericeous. The hairs may also be T-shaped, consisting of a stalk up to 0.5 mm long and a crosspiece, the trabecula. If the stalk and trabecula are wavy or curled, the pubescence is termed tomentose. The mature leaves vary from glabrous to densely pubescent; if pubescent, they are always more densely hairy below than above.

Leaves. The leaf blade is commonly cordate, ovate, or elliptical, but in some species may be linear, oblong, lanceolate, rhombic, obovate, or orbicular. In *S. angulosum* the laminas are typically sinuate-lobate, while those of *S. laciniatum* are laciniate. Neither condition is found elsewhere in the genus. The laminar apex is usually acuminate and mucronate or sometimes emarginate, especially in the West Indian endemics, or sometimes caudate. The mucro is often broken off in older leaves. The base is commonly cordate or truncate or sometimes attenuate, but auriculate in *S. angulosum, S. ciliatum, S. cordatum,* and *S. selerianum.* The margin may be eglandular, or may bear scattered sessile glands, ca 0.3–0.4 mm in diameter, and/or scattered filiform glands, which are often broken off in mature leaves. The leaves of *S. ciliatum* and *S. selerianum* are ciliate. A pair of large, usually prominent glands is found at the base of the leaf or just below the base on the petiole. In *S. ovatum* the glands are flush with the surface of the petiole, and in *S. sagraeanum* and *S. microphyllum* they are usually peg- or nail-shaped. In most species the petiole of mature leaves is several centimeters long. The small stipules, less than 1.5 mm long, are triangular though sometimes narrowly so to linear. In *S. adenophorum* they consist of a prominent circular gland with a tiny membranous tip.

Inflorescence. The flowers are always borne in umbels, corymbs, or pseudoracemes (sensu Cuatrecasas 1958), either solitary or more commonly in compound inflorescences of a dichasial nature. Each flower is borne on a pedicel subtended by two bracteoles, which itself is borne on a peduncle subtended by a bract (Fig. 1c). In some species the peduncles are very short or even absent, and the pedicels then are sessile or subsessile. The bracts are eglandular, but each bracteole sometimes bears tiny, inconspicuous glands less than 0.4 mm in diameter. In *S. adenophorum* each bracteole has two prominent glands; each gland is 0.6–0.8 mm in diameter.

Perianth (Fig. 1a). The four lateral sepals each bear a pair of oblong or ovate glands; the anterior sepal is eglandular. The petals are clawed with usually orbicular to obovate or broadly elliptical limbs, whose margins vary from erose or



a b c

FIG. 1. Structure of flower of *Stigmaphyllon*. a. Floral diagram. b. Androecium, stamen second from left opposes anterior sepal, stamen fourth from right opposes posterior petal (the "flag"), stamens with enlarged connectives and reduced locules oppose lateral sepals. c. Typical flower borne on pedicel subtended by two bracteoles; pedicel borne on peduncle subtended by one bract.

denticulate to fimbriate. The posterior petal (the flag petal) differs from the lateral four by its stouter and longer claw, often constricted at the apex, and its smaller limb, which may also differ in its shape and margin. The posterior-lateral petals have shorter claws than the anterior-lateral petals and are generally somewhat smaller.

Androecium (Fig. 1b). In most species the ten stamens are variable in shape and size but symmetrical around a plane passing through the anterior sepal and the posterior petal. The stamens associated with the three styles, i.e., that opposite the anterior sepal and those opposite the posterior-lateral petals, are usually the largest. In most species the stamens opposite the lateral sepals have slender filaments bearing enlarged connectives with greatly reduced locules. In a few species these stamens are sterile. The anthers may be glabrous or pubescent with hairs scattered along the margins of the locules and with an apical tuft. In our area only *S. ovatum* and *S. pseudopuberum* have the androecium composed of subequal stamens.

Gynoecium. The three-carpellate ovary has three free styles. The anterior style usually differs in size and shape from the posterior two, which are mirror images of each other. The apex of the anterior style may bear a foliole on each side or may only be laterally expanded or may be linear and distally blunt or distally extended into a spur or hook. The apex of a posterior style may bear a foliole on the side toward the perianth or only a lip, or may be linear and distally blunt or distally extended into a spur or hook. In flowers in which the anterior style is foliolate, the posterior styles are also foliolate. If the anterior style is efoliolate, the posterior styles either bear folioles or may lack them as well. The presence of a foliole is apparently variable in some species. In a few individuals of *S. lindenianum* and *S. microphyllum* the folioles of the anterior style are reduced to a narrow lip or absent. In *S. sagraeanum* such variation is evident in the posterior styles. Most unusual in the genus are the canaliculate-complicate posterior styles of *S. emarginatum*. Those of *S. microphyllum* are similar but bear folioles.

Fruit. The fruit is a schizocarp, which splits into three samaras, each suspended on a carpophore. Each samara bears a large dorsal wing, thickened along

the upper (adaxial) margin, which often has a tooth at the nut. The ovoid or spherical nut may also bear small lateral winglets or spurs and/or crests or may be merely ribbed or smooth. Four species in our area differ from this pattern. In *S. ovatum* the dorsal wing is reduced to an apical crest less than 1 cm high; the carpophore is absent. The samaras of *S. ciliatum* are lenticular, i.e., laterally flattened, with the narrow dorsal wing encircling the nut. In *S. puberum* the dorsal wing also encircles the nut but tapers distally. Most unusual is the samara of *S. adenodon;* the dorsal wing is also reduced and encircles an inflated nut, whose seed is surrounded by air pockets.

The embryo of most species is ovoid, with the larger outer cotyledon often distally enfolding the smaller inner cotyledon. The embryos of *S. ciliatum* and *S. humboldtianum* are flattened. Unique in the genus is the embryo of *S. ovatum*. It consists of a large outer cotyledon, ca 12–15 mm long, folded back on itself and thus forming an open circle, and a highly reduced inner cotyledon ca 1–2 mm long.

TAXONOMY

The generic description applies to species found in Mexico, Central America, and the West Indies. Characteristics found only in exclusively South American species are not included.

Stigmaphyllon Adr. Juss. in St.-Hil., Fl. Bras. merid. 3: 48. 1832 [1833].—TYPE: *Stigmaphyllon auriculatum* (Cav.) Adr. Juss.

Brachypteris Adr. Juss. in Deless., Icon. sel. 3: 20. 1837 [1838].—TYPE: *Brachypteris australis* Adr. Juss., nom. superfl. [=*Stigmaphyllon paralias* Adr. Juss.].

Vines. Leaves opposite, petiolate, lamina entire or sometimes lobed (laciniate in *S. laciniatum*), usually with a pair of large glands at the base or just below the base on the petiole, stipules inconspicuous, eglandular (glandular in *S. adenophorum*), eventually deciduous. Inflorescence an umbel, corymb, or pseudoraceme, borne solitary or commonly in dichasia, compound dichasia, or small thyrses; peduncles and pedicels present, or peduncles sometimes reduced or rarely absent; bracts and bracteoles present, persistent, eglandular, or bracteoles sometimes glandular. Sepals 5, imbricate, lateral sepals biglandular, anterior sepal eglandular. Petals 5, yellow or sometimes yellow with red, clawed; posterior petal with a stouter and longer claw, commonly constricted at the apex, and a smaller limb than lateral petals. Androecium uniseriate, stamens 10, connate proximally, sometimes subequal but usually unequal, those opposite styles the largest, those opposite lateral sepals commonly with slender filaments and enlarged connectives bearing reduced locules or sometimes sterile; anthers glabrous or pubescent. Styles 3, free to the base, stigmas internal; anterior style usually different from posterior styles, erect or slightly recurved, apex with two lateral folioles or only laterally expanded or linear and distally blunt or distally extended into a spur or hook; posterior styles alike or mirror images of each other, usually lyrate or sometimes erect, apex with a lateral foliole or lip or linear and distally blunt or distally extended into a spur or hook. Ovary 3-carpellate, 3-loculate. Fruit a schizocarp of 3 samaras on a pyramidal torus and suspended on carpophores

(except in *S. ovatum*). Samara with a large dorsal wing, thickened along the upper (adaxial) margin, and small lateral winglets and/or spurs and/or crests or the nut merely ribbed or smooth, or dorsal wing sometimes greatly reduced; nut ovoid or spheroid (lenticular in *S. ciliatum*), embryo ovoid or sometimes flattened (circular in outline in *S. ovatum*). Chromosome number n = 10.

Key to Flowering Specimens

1. Anterior style without folioles.
   2. Base of lamina auriculate.
      3. Margin of lamina eglandular; peduncles 3.3–7 mm long, (⅓–) ½–⅝ as long as pedicels; posterior styles without folioles; Guatemala. *S. cordatum.*
      3. Margin of lamina ciliate; peduncles 0.5–3 mm long, up to ⅓ as long as pedicels; posterior styles with folioles or at least a narrow lip; Mexico and Guatemala. *S. selerianum.*
   2. Base of lamina cordate, truncate, or attenuate.
      4. Styles subequal; stamens equal in shape, slightly unequal in size.
         5. Flowers (3–) 4 (–6) per umbel, the umbels borne solitary or in dichasia or rarely in a small thyrse; limb of lateral petals 9–12 mm in diameter; apex of styles extended into a spur 0.6–0.8 mm long; leaves sparsely sericeous below; Atlantic coastal lowlands and the West Indies. *S. ovatum.*
         5. Flowers ca 12–20 per congested pseudoraceme, the pseudoracemes usually borne in compound inflorescences, rarely solitary; limb of lateral petals ca 4–7 mm in diameter; apex of styles blunt or with a tiny spur up to 0.2 mm long; leaves sericeous to densely so below; highlands of Chiapas, Mexico, and northeastern Guatemala. *S. pseudopuberum.*
      4. Styles unequal, anterior style always shorter than the posterior two and (in most) different in shape; stamens unequal in shape and size.
         6. Peduncles absent to 9 mm long, less than ⅓ as long as pedicels.
            7. Stamens opposite the lateral sepals fertile, locules always present though reduced; anthers glabrous; basal leaf glands stipitate and up to (1–) 2 mm long or subsessile or one or both glands absent; Cuba and the Bahamas. *S. sagraeanum.*
            7. Stamens opposite the lateral sepals sterile (locules absent) or rarely those opposite the anterior-lateral sepals with one or two highly reduced locules; fertile anthers commonly pubescent; basal leaf glands prominent but sessile, rarely one or both glands absent.
               8. Flowers 8–18 (–27) per umbel (sometimes a corymb or pseudoraceme), the umbels commonly borne solitary, or in dichasia or compound dichasia or rarely in a small thyrse; apex of anterior style 0.9–1.7 mm long, 0.3–1.2 mm wide, linear with a spur 0.6–1.4 mm long, or triangular to rhombic; laminas extremely variable from linear to suborbicular, 0.3–7 cm wide, sparsely sericeous or tomentose or glabrous below; Cuba and the Lesser Antilles. *S. diversifolium.*
               8. Flowers (10–) 20–25 (–45) per congested or interrupted pseudoraceme (sometimes a corymb or umbel), the pseudoracemes usually in large compound inflorescences, rarely solitary; apex of anterior style 0.6–0.7 (–1.2) mm long, 0.1–0.2 mm wide, linear with a spur 0.2–0.3 (–0.6) mm long; laminas elliptical or broadly so to oblong, sometimes suborbicular or lanceolate, 2.5–15.5 cm wide, sericeous or tomentose below, indumentum sloughed off in patches and older leaves then glabrate to glabrous below; Puerto Rico, Virgin Gorda, St. John. *S. floribundum.*
         6. Peduncles present, (1.3–) 2.5–34 mm long, more than ⅓ as long as pedicels.
            9. Laminas with T-shaped hairs to tomentose below; Costa Rica. *S. columbicum.*
            9. Laminas sericeous to glabrous below.
               10. Posterior styles without folioles; West Indies except Cuba and the Bahamas. *S. emarginatum.*
               10. Posterior styles with folioles.
                  11. Laminas 0.8–3.7 cm long, 0.4–1.4 cm wide, basal glands stipitate, 0.2–0.3 mm in diameter, or one or both glands absent; Cuba. *S. microphyllum.*

11. Laminas 3.5–18.5 cm long, 2–15.5 cm wide, basal glands prominent but sessile, 0.5–3.2 mm in diameter; Mexico and Central America.
    12. Pedicels inflated and distally flared; flowers 3–9 (–12) per umbel or corymb; anthers glabrous; margin of lateral petals lacerate to dentate to fimbriate, teeth and fimbriae 0.4–1.2 mm long. *S. ellipticum.*
    12. Pedicels terete; flowers (9–) 12–35 per umbel or corymb; anthers with full-sized locules pubescent; margin of lateral petals erose to denticulate to denticulate-fimbriate, teeth and fimbriae up to 0.2 (–0.3) mm long. *S. lindenianum.*

1. Anterior style with folioles.
    13. Anterior style and anterior stamen larger than the posterior styles and their opposing stamens; laminas sparsely to densely sericeous below.
        14. Laminas densely silvery sericeous below, epidermis not visible; flowers (15–) 20–25 per umbel; margin of petals erose or denticulate or sometimes with fimbriae up to 0.2 (–0.3) mm long. *S. hypargyreum.*
        14. Laminas sericeous to sparsely so below, epidermis visible; flowers 8–15 per umbel; margin of petals with fimbriae up to 0.6 (–0.8) mm long. *S. puberum.*
    13. Anterior style and anterior stamen smaller than the posterior styles and their opposing stamens; laminas sericeous to glabrous or with T-shaped hairs to tomentose below.
        15. Margin of lamina ciliate; pedicels inflated and flared distally. *S. ciliatum.*
        15. Margin of lamina eglandular or with scattered sessile glands and/or scattered filiform glands (these often broken off in mature leaves) but never ciliate; pedicels terete.
            16. Laminas laciniate or sinuate-lobate (usually with 5–7 lobes), or rarely ovate and then the base auriculate; Hispaniola.
                17. Laminas laciniate. *S. laciniatum.*
                17. Laminas sinuate-lobate or rarely ovate. *S. angulosum.*
            16. Laminas entire or sometimes palmately (2–) 3 (–5)-lobed, base cordate, truncate, or attenuate; Mexico, Central America, Cuba, and the Lesser Antilles.
                18. Laminas with T-shaped hairs, the stalk (0.1–) 0.2–0.3 (–0.4) mm long, to tomentose below.
                    19. Bracteoles each bearing two prominent glands, each gland 0.6–0.8 mm in diameter; Costa Rica. *S. adenophorum.*
                    19. Bracteoles eglandular or with tiny, inconspicuous glands less than 0.4 mm in diameter.
                        20. Anthers glabrous.
                            21. Limb of posterior petal 6–6.5 mm long, margin with fimbriae up to 0.4 (–0.5) mm long; margin of lateral petals (fimbriate-) denticulate, fimbriae up to 0.3 (–0.4) mm long; Panama. *S. humboldtianum.*
                            21. Limb of posterior petal 6.5–8 mm long, margin erose-denticulate; margin of lateral petals erose; Costa Rica. *S. tonduzii.*
                        20. Anthers pubescent.
                            22. Margin of lamina with scattered sessile glands and sometimes also with scattered filiform glands (often broken off in older leaves), glands sometimes very few and margin appearing eglandular; peduncles ½ as long as the pedicels to subequal; anterior style 1.8–3 mm long, posterior styles 2.3–3.8 (–4) mm long; Mexico to Nicaragua. *S. retusum.*
                            22. Margin of lamina with stipitate, nail-like glands 0.2–0.5 mm long; peduncles subequal to 2½ times as long as the pedicels; anterior style 2.8–3.7 mm long, posterior styles 3.5–4.7 mm long; Grenada. *S. adenodon.*
                18. Laminas sericeous to glabrous or with short-stalked (up to 0.1 mm long) T-shaped hairs below.
                    23. Flowers 4 in a solitary umbel; laminas 0.8–3.7 cm long, 0.4–1.4 cm wide, basal glands stipitate, 0.2–0.3 mm in diameter, or one or both glands absent; Cuba. *S. microphyllum.*
                    23. Flowers (9–) 12–40 per umbel, the umbels borne in compound inflorescences; laminas 4.5–18.5 cm long, 4–15.5 cm wide, basal glands

prominent but sessile, 1–3.2 mm in diameter; Mexico, Central America, Martinique (St. Vincent?).

24. Anthers pubescent. *S. lindenianum.*
24. Anthers glabrous.
    25. Styles glabrous; flowers 13–ca 20 per umbel; laminas sericeous or densely so, or with short-stalked T-shaped hairs below, indumentum sloughed off in patches and older leaves often glabrate; Panama. *S. panamense.*
    25. Styles pubescent; flowers 20–40 per umbel, corymb, or pseudoraceme; laminas sparsely sericeous (hairs evenly distributed) to glabrous below; Martinique (St. Vincent?). *S. convolvulifolium.*

Key to Fruiting Specimens

Because most characters used to distinguish species of *Stigmaphyllon* are found in the flowers and because the size of the dorsal wing and the nature of the lateral ornamentation of the nut are often variable within the species, the key to fruiting material is less definitive than the key to flowering specimens. The choices in couplet 4, dorsal wing 1.5–3.5 cm long vs 3.5–5.4 cm long, reflect the tendency for the species so grouped to fall into two such categories, but these categories are not absolute. The highly variable *S. retusum* is keyed twice. *Stigmaphyllon adenophorum* is not known in fruit. Also excluded here is *S. columbicum,* a Colombian species recorded from Costa Rica from two flowering collections. The specimens differ somewhat from the Colombian material, and future collections, especially in fruit, may cause them to be excluded from *S. columbicum.* The samara of *S. columbicum* has a dorsal wing 3.1–4.1 cm long, without a tooth on the upper margin, and one or two rows of lateral winglets.

1. Dorsal wing flared distally, broadest at or beyond midpoint; lateral wings present, or absent and the nut smooth or bearing spurs, crests, and/or ridges.
    2. Laminas laciniate or sinuate-lobate (usually with 5–7 lobes) or rarely ovate; Hispaniola.
        3. Dorsal wing 1.5–1.8 cm long; laminas laciniate. *S. laciniatum.*
        3. Dorsal wing 2.8–4.5 cm long; laminas sinuate-lobate or rarely ovate. *S. angulosum.*
    2. Laminas entire, or sometimes palmately (2–) 3 (–5)-lobed in plants from Mexico and Central America.
        4. Dorsal wing (3.4–) 3.5–5.4 cm long, lateral wings present or absent.
            5. Laminas with T-shaped hairs, the stalk (0.1–) 0.2–0.5 mm long, to tomentose below.
                6. Embryo flattened, ca 3 times as long as wide; upper margin of dorsal wing with a tooth; Darién, Panama. *S. humboldtianum.*
                6. Embryo ovoid, ca 2 times as long as wide; upper margin of dorsal wing with or without a tooth; Mexico to Nicaragua. *S. retusum.*
            5. Laminas sericeous or with short-stalked (up to 0.1 mm high) T-shaped hairs to glabrous below.
                7. Dorsal wing constricted at the nut to 0.3–0.4 cm wide, upper margin without a tooth; laminas densely silvery sericeous below; Panama. *S. hypargyreum.*
                7. Dorsal wing not constricted at the nut, more than 0.4 cm wide, upper margin with a tooth; laminas densely to sparsely sericeous to glabrous below.
                    8. Base of lamina auriculate, margin with cilia up to 8 mm long (often broken off in older leaves); flowers 8–12 per umbel, corymb, or pseudoraceme; Oaxaca and Chiapas, Mexico. *S. selerianum.*
                    8. Base of lamina truncate to cordate or attenuate, margin eglandular, or with scattered sessile glands only or also with scattered filiform glands up to 2.5 mm long (often broken off in older leaves); flowers 12–40 per umbel, corymb, or pseudoraceme.
                        9. Dorsal wing 4–5.4 cm long; basal leaf glands prominent to stoutly stalked (pegshaped); highlands of Chiapas, Mexico, and northeastern Guatemala. *S. pseudopuberum.*
                        9. Dorsal wing 3.4–3.8 cm long; basal leaf glands prominent but sessile; lowlands.

10. Laminas ovate or elliptical, sericeous or with short-stalked T-shaped hairs below, indumentum sloughed off in patches and older leaves then glabrate, margin eglandular or with scattered sessile glands; Panama. *S. panamense.*

10. Laminas cordate or narrowly so, sparsely sericeous (hairs evenly distributed) to glabrous below, margin with scattered sessile glands and scattered filiform glands up to 2.5 mm long (often broken off in older leaves); Martinique (St. Vincent?). *S. convolvulifolium.*

4. Dorsal wing 1.5–3.5 cm long, lateral wings absent, the nut smooth or bearing spurs and/or crests.

11. Peduncles less than ⅓ as long as the pedicels.

12. Laminas glabrous below, basal glands stipitate or sometimes subsessile or one or both glands absent; dorsal wing 1.8–2.4 cm long, nut smooth; Cuba and the Bahamas. *S. sagraeanum.*

12. Laminas tomentose or sericeous to glabrous below, basal glands prominent but sessile (sometimes absent in *S. floribundum*); dorsal wing 1.5–3.2 cm long, nut smooth or bearing spurs and/or crests.

13. Dorsal wing 1.2–2 cm long, nut smooth; flowers 8–18 (–27) per umbel, corymb, or pseudoraceme, these often borne solitary or sometimes in dichasia or compound dichasia, rarely in small thyrses; laminas 0.3–6.8 cm wide; Cuba and the Lesser Antilles. *S. diversifolium.*

13. Dorsal wing 1.8–3.2 cm long, nut smooth or bearing spurs and/or crests; flowers (10–) 20–25 (–40) per umbel, corymb, or pseudoraceme, these usually borne in large compound inflorescences, rarely solitary; laminas 2.5–15.5 cm wide; Puerto Rico, Virgin Gorda, St. John. *S. floribundum.*

11. Peduncles ⅓ as long as to longer than the pedicels.

14. Lamina with T-shaped hairs to tomentose below.
S. retusum (Mexico to Nicaragua); *S. tonduzii* (Costa Rica).

14. Lamina sericeous to glabrous below.

15. Base of lamina auriculate; Guatemala. *S. cordatum.*

15. Base of lamina attenuate or truncate to cordate.

16. Basal glands of lamina stipitate or subsessile or sometimes one or both glands absent; flowers 4 in a solitary umbel; Cuba. *S. microphyllum.*

16. Basal glands of lamina prominent but sessile; flowers 3–35 per umbel, corymb, or pseudoraceme, these borne solitary or in compound inflorescences.

17. Pedicels inflated and distally flared, 3–9 (–12) flowers per umbel (sometimes in a corymb); Mexico and Central America. *S. ellipticum.*

17. Pedicels terete, not inflated or flared; flowers (6–) 12–35 per umbel, corymb, or pseudoraceme.

18. Dorsal wing 2–3.5 cm long; flowers in an umbel or corymb, these borne in compound inflorescences; basal leaf glands 1.2–3.2 mm in diameter; Mexico and Central America. *S. lindenianum.*

18. Dorsal wing 1.6–2.2 cm long; flowers usually in a congested or open pseudoraceme, sometimes in an umbel or rarely in a corymb, these usually borne solitary, sometimes in dichasia; basal leaf glands 0.3–1.2 mm in diameter; West Indies except Cuba and the Bahamas. *S. emarginatum.*

1. Dorsal wing broadest at the nut and tapering distally, encircling the nut, or reduced to a crest less than 1 cm high; lateral wings absent, the nut smooth or bearing prominent ribs or ridges and/or crests.

19. Nut laterally flattened, the samara lenticular; base of lamina auriculate, margin with cilia up to 4 (–5.5) mm long. *S. ciliatum.*

19. Nut ovoid or spherical; base of lamina truncate, cordate, or attenuate, margin eglandular, or with scattered sessile glands, or with stipitate (nail-like) glands up to 0.5 mm long.

20. Nut inflated, 12–19 mm in diameter, seed surrounded by air pockets; laminas with T-shaped hairs below, margin with stipitate (nail-like) glands; Grenada. *S. adenodon.*

20. Nut not inflated, 5–11 mm in diameter, seed not surrounded by air pockets; laminas sericeous or sparsely so below, margin eglandular or with scattered sessile glands.
    21. Dorsal wing reduced to an apical crest 0.4–0.9 cm high; apex of lamina acute, obtuse, or sometimes apiculate. *S. ovatum.*
    21. Dorsal wing encircling the nut, 2.6–3.7 cm long measured from base of nut; apex of lamina acuminate. *S. puberum.*

Stigmaphyllon adenodon Adr. Juss., Ann. Sci. Nat. Bot., sér. 2, 13: 288. 1840.—TYPE: TRINIDAD, 1824, *de Schach s.n.* (holotype: K!).

Stigmaphyllon grenadense Nied., Ind. Lect. Lyc. Brunsberg. p. aest. 1900: 26. 1900.—TYPE: TOBAGO. "In convalli fluminis Bacolit ad Cradley versus" (fide Niedenzu), *Eggers 5726* (lectotype, here designated: K!; isolectotypes: A! M! P! S!).

Stigmaphyllon kuhlmannii Pilger, Repert. Spec. Nov. Regni Veg. 42: 178. 1937.—TYPE: PERU. Solimões, Yanache, 2 Mar 1924, *Kuhlmann 1550* (holotype: RB–26279!).

Laminas 5–14.5 cm long, 3.5–15 cm wide, cordate or ovate, the smaller triangular, apex mucronate or acuminate-mucronate, base cordate or in smaller leaves truncate, glabrate to glabrous above, with T-shaped hairs below, margin with stipitate (nail-like) glands 0.2–0.5 mm long, basal glands prominent, sessile, each 1–2.4 mm in diameter; petioles 1.6–11.5 cm long; stipules triangular, eglandular. Flowers 15–30 (–35) per umbel or corymb, these borne in small thyrses or dichasia. Peduncles 3.5–14 (–17) mm long, pedicels 3.5–6 mm long, terete, peduncles subequal to or up to 2½ times as long as pedicels; bracts 0.8–1.8 (–2) mm long, broadly triangular to suboblong, bracteoles 0.6–1.2 (–1.4) mm long, ovate to oblong, eglandular. Limb of anterior-lateral petals ca 9.5–11 mm long and wide, limb of posterior-lateral petals ca 8–9 mm long and wide, limb of posterior petal ca 8–8.5 mm long and wide, all orbicular or sometimes broadly ovate, margin erose or erose-denticulate. Stamens unequal, those opposite the posterior styles the largest, those opposite the lateral sepals with the connective enlarged and the locules reduced; anthers pubescent. Anterior style 2.8–3.7 mm long, shorter than the posterior two, glabrous; apex 1.8–2.3 mm long, each foliole (1.1–) 1.4–1.5 mm long, (0.5–) 0.8–1.1 (–1.3) mm wide, oblong or parabolic. Posterior styles 3.5–4.7 mm long, glabrous, lyrate; folioles (1.3–) 1.8–2.5 mm long, (1.3–) 1.5–2.1 mm wide, oblong. Dorsal wing of samara encircling the nut, 3–4.4 cm high measured from base of nut, 1.1–2.1 cm wide; nut smooth or bearing shallow ridges or crests, these often interconnected, nut inflated, seed surrounded by air pockets; embryo ovoid, ca two times as long as wide.

Phenology. Collected in flower and fruit throughout the year.

Distribution. Amazon basin and disjunct to the Paria Peninsula of Venezuela, Trinidad, and Tobago; in the Lesser Antilles known only from Grenada; in wet areas, along rivers and in rain forest and flooded forest; sea level to 150 m.

ADDITIONAL SPECIMENS EXAMINED. GRENADA: Tempé, *Broadway s.n.* (Feb 1905: BR; 18 Dec 1904: F, GH; Dec 1905: NY); Grand'Etang, *Smith 109* (K).

Stigmaphyllon adenodon is the only species in our area in which the nut of the samara is inflated. The locule is chambered so that the seed is surrounded by air pockets. The leaves differ from those of most of our species in that the small marginal glands are stalked and flared at the apex (nail-like).

Stigmaphyllon adenophorum C. Anderson, Syst. Bot. 11: 120. 1986.—TYPE: COSTA RICA. Puntarenas, Telecommunication Hill above the town of Golfito, ca 500 m, 16 Jul 1977, *Wilbur et al. 22761* (holotype: MICH!; isotype: DUKE!).

Laminas 8.5–12 cm long, 4.4–7 cm wide, triangular to ovate, apex acuminate-aristate, base truncate or sometimes subattenuate, glabrate to glabrous above, with T-shaped hairs below, margin eglandular, basal glands prominent, sessile, each 1–1.6 mm in diameter, borne near the midpoint of the petiole of smaller leaves in the inflorescence; petioles 2–4.3 cm long; each stipule a prominent, circular gland, ca 0.8 mm in diameter, with a minute membranous acute tip. Flowers 16–25 per corymb, these borne in dichasia or small thyrses. Peduncles 4–8 mm long, pedicels 5.2–7.5 mm long, terete, peduncles and pedicels subequal or equal; bracts 1.2–1.6 mm long, triangular, bracteoles 1.2–1.5 mm long, ovate, each bearing two prominent glands, each gland 0.6–0.8 mm in diameter. Limb of anterior-lateral petals ca 11.5 mm long, ca 10 mm wide, limb of posterior-lateral petals ca 8–9 mm long, ca 6–7 mm wide, limb of posterior petal ca 7.5 mm long, ca 6 mm wide, all obovate, margin erose. Stamens unequal, those opposite the posterior styles the largest, those opposite the anterior-lateral sepals with the connective enlarged and the locules reduced; anthers glabrous. Anterior style 3.7 mm long, shorter than the posterior two, glabrous; apex 1.8 mm long, each foliole ca 1.5 mm long, ca 0.8 mm wide, oblong. Posterior styles 4.2 mm long, glabrous, lyrate; each foliole 2 mm long, 2.5 mm wide, oblate. Samara not seen. Fig. 2.

Stigmaphyllon adenophorum is known only from the type. It is easily recog-

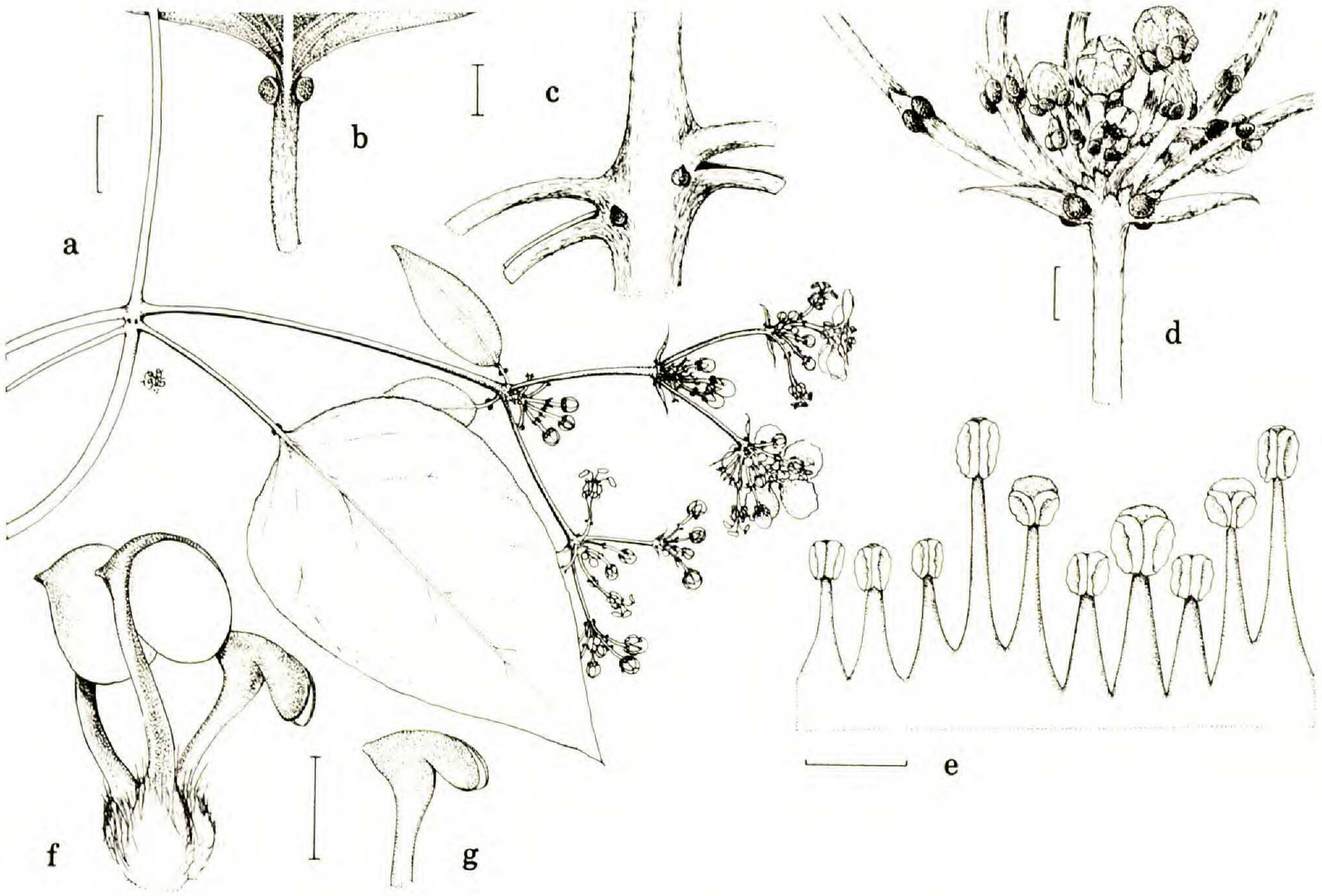


FIG. 2. *Stigmaphyllon adenophorum*. a. Flowering branch. b. Base of leaf. c. Section of stem with glandular stipules. d. Base of umbel; note glands on bracteoles. e. Androecium. f. Gynoecium. g. Distal portion of anterior style. Scale: for a, bar = 1.5 cm; for b–g, bar = 2 mm. (Based on *Wilbur et al. 22761*.)

nized by the stipules, which consist of a large prominent gland with a tiny membranous apex, and by the bracteoles, each of which bears a pair of prominent glands 0.6–0.8 mm in diameter. No other species in our area has glandular stipules or bears such glands on the bracteoles.

Stigmaphyllon angulosum (L.) Adr. Juss., Ann. Sci. Nat. Bot., sér. 2, 13: 288. 1840. *Banisteria angulosa* L., Sp. pl. 1: 427. 1753. *Stigmaphyllon angulosum* f. 2. *typicum* Nied., Ind. Lect. Lyc. Brunsberg. p. aest. 1900: 12. 1900.—TYPE: *t. 92* in Plumier, Descr. pl. Amér. 1693.

Banisteria deformis Desv. ex Hamilton, Prodr. pl. Ind. occ. 40. 1825.—TYPE: herb. Desvaux, fide Jussieu, 1843 (holotype: P?).

Stigmaphyllon angulosum f. 1. *hederifolium* Nied., Ind. Lect. Lyc. Brunsberg. p. aest. 1900: 12. 1900.—SYNTYPES: *Mayerhoff 171, Picarda 948, 1358* (B, destroyed).

Laminas 4.2–16 cm long, 4.2–17 cm wide, sinuate-lobate with usually 5–7 lobes or rarely ovate, apex of each lobe apiculate, base auriculate, sericeous to glabrous above, sparsely to densely sericeous or sparsely to densely tomentose to glabrate to glabrous below, margin with filiform glands (up to 3 mm long) and/or sessile glands (up to 0.6 mm in diameter), basal glands prominent, sessile, each 1.2–1.8 mm in diameter; petioles 1.6–7.7 (–9) cm long; stipules broadly triangular, eglandular. Flowers 15–35 (–ca 40) per corymb or congested pseudoraceme, sometimes in an umbel, these borne in simple or compound dichasia or sometimes in a small thyrse or sometimes solitary. Peduncles 3.4–12 mm long, pedicels 5.5–10 mm long, terete, peduncles usually shorter than or sometimes subequal to or rarely slightly longer than the pedicels; bracts 0.7–1.5 mm long, triangular, bracteoles 0.8–1.5 mm long, triangular, eglandular. Limb of anterior-lateral petals 13–14 mm long and wide, limb of posterior-lateral petals ca 11.5–13 mm long and wide, limb of posterior petal ca 10–11 mm long and wide, all orbicular, margin irregularly dentate and/or fimbriate, especially in the distal ⅔, fimbriae up to 0.4 mm long. Stamens unequal, those opposite the posterior styles the largest, those opposite the anterior-lateral sepals with the connective enlarged and the locules reduced; anthers glabrous. Anterior style 2.6–3.6 mm long, shorter than the posterior two, glabrous or with a few scattered hairs; apex 1.1–1.6 mm long, each foliole 0.7–1.4 mm long, 0.4–1.2 mm wide, narrowly to broadly parabolic. Posterior styles 3.5–4.2 mm long, glabrous or with scattered hairs, lyrate; folioles 1.3–1.6 mm long and wide, nearly square. Dorsal wing of samara 2.8–4.5 cm long, 1.2–1.8 cm wide, upper margin with a tooth; nut with a pair of lateral winglets; embryo ovoid, ca two times as long as wide.

Phenology. Collected in flower and fruit throughout the year.

Distribution. Endemic to Hispaniola; pine woodlands and mixed hardwood forests, thickets, and grassy slopes; sea level to 1250 m.

REPRESENTATIVE SPECIMENS. DOMINICAN REPUBLIC. Prov. Azua, Sierra de Ocoa, San José de Ocoa, *Ekman H11880* (S, US); Barahona, *Fuertes 17* (BR, F, G, GH, MO, NY, S, US, W); prov. San Juan, Juan Santiago, *Howard & Howard 9295* (GH, MICH, NY, S, US); Monte Cristo, dist. Sabaneta, *Valeur 66* (G, MICH, S, US); prope Constanza, *von Türckheim 3186* (BR, G, M, NY, W).—HAITI. Massif du Nord, Port-Margot, *Ekman H2924* (G, S, US); Massif du Nord, Port-de-Paix, Haut-Piton, *Ekman H4886* (NY, S); trail to Morne Rochelois, Miragoane and vicinity, *Eyerdam 517* (GH, NY, P, US); vicinity of Mission, Fonds Varettes, *Leonard 3630* (NY, US); Nord, vicinity of Dondon, *Leonard 8633* (F, US); vicinity of Bombardopolis, *Leonard & Leonard 13411* (NY, US).

Stigmaphyllon angulosum, endemic to Hispaniola, is easily recognized by its unusual leaves, which are unique in the genus. The lamina is typically shallowly to deeply sinuate-lobate with ca 5–7 lobes, or rarely ovate, and auriculate at the base. In Hispaniola the only other species with foliolate styles is *S. puberum,* whose leaves are usually lanceolate to elliptical but never lobed. In *S. angulosum* the posterior styles and their opposing stamens are larger than the anterior style and its opposing stamen; in *S. puberum* they are smaller. *Stigmaphyllon angulosum* is probably most closely related to *S. laciniatum,* endemic to Gonâve Island and characterized by laciniate leaves.

Stigmaphyllon ciliatum (Lam.) Adr. Juss. in St.-Hil., Fl. Bras. merid. 3: 49. 1832 [1833]. *Banisteria ciliata* Lam., Encycl. 1: 369, 1783 [1785].—TYPE: BRAZIL. *Commerson s.n.* (holotype: P!; isotype?: C!).

Banisteria glauca Desf., Tabl. école bot., ed. 3, 406. 1829.—TYPE: based on living material at the Botanical Garden at Paris.

Laminas 4.3–9.5 cm long, 3.5–7.3 cm wide, broadly ovate or cordate, apex mucronate, base auriculate, glabrous or with a few scattered, appressed hairs above and below, margin with cilia up to 4–5.5 mm long, basal glands prominent, sessile, each 0.8–1.3 mm in diameter; petioles 1.6–5.1 cm long; stipules triangular, eglandular. Flowers 3–8 per umbel, these borne solitary or sometimes in dichasia. Peduncles absent to 5.3 mm long, pedicels 6–13 mm long, inflated, peduncles up to ½ as long as pedicels; bracts 1–2 mm long, ovate to broadly so, bracteoles 0.9–1.3 mm long, almost square to broadly obovate, eglandular. Limb of anterior-lateral petals 13.5–18 mm long and wide, limb of posterior-lateral petals 11.5–16 mm long and wide, limb of posterior petal 8–11 mm long and wide, all orbicular, margin fimbriate or sometimes denticulate-fimbriate, fimbriae up to 0.5 (–0.9) mm long. Stamens unequal, those opposite the posterior styles the largest, those opposite the lateral sepals with the connective enlarged and the locules reduced or with only one reduced locule or sterile; anthers glabrous. Anterior style 3.4–4.2 mm long, shorter than the posterior two, glabrous; apex 1.4–1.5 mm long, each foliole (0.9–) 1.4–1.5 mm long, 0.9–1.2 (–1.5) mm wide, parabolic or oblong. Posterior styles 4.1–5.6 mm long, glabrous, lyrate; folioles (1.3–) 1.8–2.3 mm long, 1.9–2.4 mm wide, square to parabolic. Samara lenticular, dorsal wing 2–2.5 cm long, 1.6–1.8 cm wide, encircling the nut; nut smooth; embryo flattened, ca three times as long as wide.

Phenology. Collected in flower and fruit throughout the year.

Distribution. Atlantic lowlands of Belize, Guatemala, Honduras, and Nicaragua, naturalized in Barbados; most commonly in wet localities: along rivers, in mangrove or freshwater swamps, on or near beaches, and also at forest edges and roadsides; sea level to 50 m.

REPRESENTATIVE SPECIMENS. BARBADOS. Bioser Hill, St. Joseph, *Gooding 335* (NY); Chemin de Bridgetown á Bathsheba, *Stehlé 2946* (NY); Chemin du Turner's Hall Wood, *Stehlé 2979* (NY).—BELIZE. Stann Creek: Gragra Creek, Commerce Bight, *Gentle 8019* (LL, MICH, UTD); Dangriga, *Proctor 36604* (MO); Stann Creek, *Schipp S59* (F, G), *Schipp 880* (F, G, GH, MICH, MO, NY, S, WIS). Toledo: Cowpen, Swarsey Branch, Monkey River, *Gentle 4018* (A, F, MICH, MO, NY, U, UTD).—GUATEMALA. Izabal: Puerto Barrios, *Deam 6018* (GH, MICH, US); Livingston, *Donnell Smith 1805* (US), *Lewton 430* (F, GH, MEXU), *von Türckheim II–1356* (US).—HONDURAS. Colón: 4.5 mi NE of Trujillo on old road to Castilla, 15°57′N, 85°54′W, *Saunders 399* (MO, TEX). Gracias a Dios: alrededores de Puerto Lempira, *Clare 153* (MICH).—NICARAGUA. Zelaya: vicinity of Awastara, ca 14°19′N, 83°12–13′W, *Stevens 17741* (MO).

Stigmaphyllon ciliatum is named for its regularly and persistently ciliate leaf margins. The distinctive leaves are ovate to cordate with such deeply auriculate bases that the lobes overlap. The large flowers, borne on inflated pedicels, are aggregated in 3–8-flowered, often solitary umbels. This is the only species in our area with lenticular, i.e., laterally flattened, samaras.

This species occurs in the Atlantic coastal lowlands from Belize to Uruguay but sporadically so. It is not known from Costa Rica and Panama but may be expected there; the three records from Honduras and Nicaragua are less than ten years old. *Stigmaphyllon ciliatum* is commonly cultivated and has apparently escaped and become naturalized in Barbados.

Stigmaphyllon columbicum Nied., Verz. Vorles. Ak. Braunsberg W.–S. 1912–1913: 26. 1913.—TYPE: COLOMBIA. Cundinamarca: Anapoima, 700 m, *Triana s.n.* (lectotype, here designated: G!; isolectotypes: COL! K!).

Laminas 5–15.5 cm long, 3.8–14.5 cm wide, cordate or narrowly so to triangular to narrowly ovate, rarely suborbicular, apex acuminate-mucronate, base cordate or sometimes truncate, glabrous above, tomentose to sparsely so below, margin with stipitate (nail-like) glands up to 0.6 mm long (Costa Rica), margin with scattered sessile glands and/or scattered filiform glands up to 1.5 mm long (Colombia), basal glands prominent, sessile, each 1–1.7 mm in diameter; petioles 1.1–7 cm long; stipules triangular to broadly so, eglandular. Flowers 20–35 (–40) per congested pseudoraceme or corymb, these borne in dichasia, compound dichasia, or small thyrses. Peduncles (5.5–) 7.5–15 mm long, pedicels 3.5–8.5 mm long, terete, peduncles (1⅕) 2–3⅓ times as long as pedicels; bracts 1.2–2.8 mm long, narrowly triangular, bracteoles 0.8–1.8 mm long, oblong or triangular, eglandular or bracteole with two inconspicuous glands up to 0.2 mm in diameter. Limb of anterior-lateral petals 10–12.5 mm long and wide, limb of posterior-lateral petals 8–10 mm long and wide, all orbicular, margin erose; limb of posterior petal ca 8–12 mm long and wide, broadly obovate to suborbicular, margin erose. Stamens unequal, those opposite the posterior styles the largest, those opposite the anterior-lateral sepals with the connective enlarged and the locules reduced; anthers glabrous. Anterior style 3–3.7 mm long, shorter than the posterior two, glabrous; apex 1.3–1.7 mm long including a spur (0.2–) 0.3–0.5 mm long, apex 0.2–0.3 mm wide, folioles absent. Posterior styles (3.7–) 4–4.6 mm long, glabrous or rarely with a few scattered hairs, lyrate; folioles (1.6–) 2–2.6 mm long, (1.4–) 1.7–2.4 mm wide, broadly rectangular to square. In Colombian material: Dorsal wing of samara 3.1–4.1 cm long, 1–1.6 cm wide, upper margin without a tooth; nut with lateral winglets in one or two rows; embryo ovoid, ca two times as long as wide.

Phenology. Collected in Colombia throughout the year, in Costa Rica in August.

Distribution. Colombia, two collections from Costa Rica; in roadside thickets and matorrales, along rivers, at forest edge; 50–1700 m.

SPECIMENS EXAMINED. COSTA RICA. San José: ca 15.4 km S of Puriscal and 0.3 km S of Salitrales off the road to Quepos, *Almeda et al. 3383* (CAS, F, MICH); ca 2 km beyond Salitrales towards Parritas or ca 16 km SE of Puriscal, *Wilbur et al. 23864* (DUKE, F, MICH).

Stigmaphyllon columbicum is one of three species in Central America that have an efoliolate anterior style and foliolate posterior styles. Its leaves are tomentose to sparsely so below. The laminas of the Mexican *S. selerianum* and of the widespread *S. ellipticum* are sparsely sericeous to glabrous below. *Stigmaphyllon columbicum* might also be confused in Costa Rica with *S. adenophorum* and *S. lindenianum,* but in both all three styles bear large folioles.

This is a Colombian species, which is known in our area only from the two collections (the same population?) cited above. The Costa Rican plants differ from Colombian specimens in the glands of the leaf margin. In typical *S. columbicum,* the margins bear scattered sessile glands and/or scattered filiform glands up to 1.5 mm long (commonly broken off in mature leaves). In the Costa Rican specimens, the marginal glands are stalked, 0.2–0.6 mm long, and flared at the apex so that they appear nail-like. Additional collections from Central America, especially in fruit, need to be studied to determine whether this difference deserves taxonomic recognition.

Stigmaphyllon convolvulifolium Adr. Juss., Ann. Sci. Nat. Bot., sér. 2, 13: 289. 1840.—TYPE: FRENCH GUIANA. Cayenne, *Martius s.n.* (lectotype, here designated: P!).

Laminas 5–16 cm long, 4.5–12 cm wide, cordate, apex acuminate-mucronate, base cordate, sparsely sericeous to glabrous above and below, margin with sessile glands and filiform glands up to 2.5 mm long, basal glands prominent, sessile, each 1.1–2.4 mm in diameter; petioles 1.5–6.8 (–10.5) cm long; stipules triangular or broadly so, eglandular. Flowers 15–40 per congested pseudoraceme or corymb, these borne in dichasia, compound dichasia, or small thyrses. Peduncles 4–12.5 mm long, pedicels 3.5–9 mm long, terete, peduncles ⅓–2 times as long as pedicels; bracts 1–1.7 mm long, triangular, bracteoles 1–1.5 mm long, broadly oblong to ovate, eglandular, each bracteole with two inconspicuous glands, each up to 0.4 mm in diameter. Limb of anterior-lateral petals 11–12 mm long and wide, limb of posterior-lateral petals 8–11 mm long and wide, limb of posterior petal ca 6.5–8 mm long and wide, all orbicular, margin erose to denticulate-fimbriate, fimbriae up to 0.2 mm long. Stamens unequal, those opposite the posterior styles the largest, those opposite the lateral sepals with the connective enlarged and the locules reduced or those opposite the posterior-lateral sepals with the locules only slightly reduced; anthers glabrous. Anterior style 2.8–3.3 mm long, shorter than or subequal to the posterior two, pubescent in the proximal ⅓–½; apex 1.5–1.9 mm long, sometimes extended beyond the folioles into a spur up to 0.2 mm long, each foliole (0.6–) 0.9–1.5 mm long, 0.7–1.5 mm wide, parabolic to broadly lunate to square. Posterior styles 3.1–4 mm long, pubescent in the proximal ½–¾, lyrate; folioles 1.5–1.6 mm long, 1.6–2 mm wide, oblate to trapezoidal to square. Dorsal wing of samara 3.3–4 cm long, 1.2–1.4 cm wide, upper margin with a tooth; nut with a pair of lateral winglets only or also bearing spurs and/or crests; embryo ovoid, ca two times as long as wide.

Stigmaphyllon convolvulifolium differs from all other species in our area in that its styles are pubescent instead of glabrous. It is a South American species and has been reported only three times from the Lesser Antilles. I have only seen the collections from Martinique: *Duss 1473,* Marigot, Ste. Marie (NY); *Terrasson* in 1796 (P–JU). Niedenzu (1928) also cites *Smith & Smith 418* from St. Vincent.

Stigmaphyllon cordatum Rose in Smith, Bot. Gaz. 18: 198. 1893.—TYPE: GUATEMALA. Guatemala: 5000 ft, Mar 1892, *Heyde & Lux 3267* (holotype: US!; isotypes: GH! NY!).

Laminas 6.1–11.5 mm long, 4.5–8.5 cm wide, cordate or narrowly so, apex acuminate or briefly so to mucronate, base auriculate, glabrous above and below, margin eglandular, basal glands prominent, sessile, each 1.1–1.7 mm in diameter; petioles 2.2–6.3 cm long; stipules triangular, eglandular. Flowers 15–20 per umbel, corymb, or pseudoraceme, these borne solitary or in dichasia. Peduncles 3.3–7 mm long, pedicels 6.5–13.5 mm long, terete, peduncles (⅓–) ½–⅚ times as long as pedicels; bracts 1.5–2.3 mm long, narrowly triangular, bracteoles 1.5–1.8 mm long, narrowly triangular to sublinear, eglandular. Limb of anterior-lateral petals ca 12–13 mm long and wide, limb of posterior-lateral petals ca 11–12 mm long and wide, all orbicular, margin erose-dentate; limb of posterior petal ca 10–11 mm long, ca 8–9 mm wide, elliptical to obovate, glabrous, margin erose-dentate or sometimes also with a few fimbriae up to 0.4 mm long. Stamens unequal in size, those opposite the posterior styles the largest; anthers subequal in shape, glabrous. Anterior style 2.7–3.3 mm long, shorter than the posterior two, glabrous; apex 1.4–1.5 mm long, linear or narrowly lanceolate or expanded proximally and triangular, 0.3–0.6 mm wide, folioles absent. Posterior styles 3.5–4.2 mm long, glabrous, lyrate; apex 1.4–1.8 mm long, linear or expanded proximally on the side toward the perianth and semi-triangular, folioles absent. Dorsal wing of samara ca 3 cm long, ca 1.2 cm wide, upper margin with a tooth; nut with prominent ribs; embryo not seen.

Phenology. Collected in flower in December and February, in fruit in December and March.

Distribution. Known only from Huehuetenango and Guatemala, Guatemala; in thickets; ca 1500–2500 m.

ADDITIONAL SPECIMENS EXAMINED. GUATEMALA. Huehuetenango: Chiantla, *Hunnewell 17152* (GH); Aguacatán, *Skutch 1941* (F, NY, US); vicinity of Aguacatán, near the spring of San Juan, *Standley 83145* (US), *83149* (F).

Stigmaphyllon cordatum is most similar to *S. selerianum,* endemic to Oaxaca and Chiapas, Mexico. They both have cordate, auriculate leaves. Those of *S. cordatum* have an eglandular margin and are glabrous, but those of *S. selerianum* have a ciliate margin and are sparsely sericeous to glabrate below. The peduncles of *S. cordatum* are 3.3–7 mm long and (⅓–) ½–⅚ times as long as the pedicels. The bracts and bracteoles are narrowly triangular to sublinear. The peduncles of *S. selerianum* are much shorter, 0.5–3 mm long, up to ⅓ as long as the pedicels, and the bracts and bracteoles are broadly triangular.

Stigmaphyllon diversifolium (H.B.K.) Adr. Juss., Ann. Sci. Nat. Bot., sér. 2, 13: 290. 1840. *Banisteria diversifolia* H.B.K., Nov. gen. sp. 5: 159. 1821 [1822].—TYPE: CUBA. Havana, *Humboldt & Bonpland s.n.* (holotype: P–HBK!).

Banisteria ledifolia H.B.K., Nov. gen. sp. 5: 159. 1821 [1822]. *Stigmaphyllon ledifolium* (H.B.K.) Small, N. Amer. fl. 25(2): 141. 1910.—TYPE: CUBA. Havana, *Humboldt & Bonpland s.n.* (holotype: P–HBK!).

Stigmaphyllon lineare Wright ex Griseb., Catal. pl. cub. 43. 1866.—TYPE: CUBA. Cabo del Rey, *Wright 2156* (holotype: GH!; isotypes: G! MO! P!).

Stigmaphyllon sericeum Wright ex Griseb., Catal. pl. cub. 43. 1866. *Stigmaphyllon diversifolium* β *sericeum* (Wright ex Griseb.) Gómez, Anales Soc. Esp. Hist. Nat. 19: 232. 1890.—TYPE: CUBA. Río Toro, *Wright 2155* (holotype: GH!; isotypes: G! P!).

Stigmaphyllon rhombifolium Wright in Sauv., Anales Acad. Ci. Méd. Habana 5: 244. 1868.—TYPE: CUBA. "Potreros de D. Francisco Sauvalle. Bahía Honda y Santa Cruz de los Pinos," *Wright 3521* (holotype: HAB?; isotypes: NY! P! S! US!).

Stigmaphyllon cordifolium Nied., Ind. Lect. Lyc. Brunsberg. p. hiem. 1899–1900: 8. 1899.—TYPE: MARTINIQUE, fide C. D. Adams, pers. comm., (labeled "Fl. trinitatis"), *Sieber 135* (lectotype, here designated: G!; isolectotypes: F! GH! M! MO! W!).

Laminas 1.8–14.7 cm long, 0.3–6.8 cm wide, extremely variable: linear to lanceolate to elliptical to ovate to obovate to rhombic to orbicular, apex mucronate or mucronate-emarginate, base truncate to cordate or acute, tomentose or sparsely so or sericeous to glabrous above and below, margin eglandular, basal glands prominent, sessile, each 0.3–1 (–1.4) mm in diameter or sometimes absent; petioles 1–13.5 cm long; stipules narrowly triangular to linear, eglandular. Flowers 8–18 (–27) per umbel, or sometimes in a corymb or pseudoraceme, these often borne solitary, sometimes in dichasia or compound dichasia, rarely in small thyrses. Peduncles absent to 3.5 mm long, pedicels 7–22 mm long, terete, peduncles if present always much shorter than pedicels; bracts 0.9–2.2 mm long, narrowly triangular, bracteoles 0.5–1.1 mm long, narrowly triangular, eglandular. Limb of lateral petals 7.5–11 mm long and wide, limb of the posterior petal (6.5–) 7.8–8.5 (–9.5) mm long and wide, all orbicular, margin erose. Stamens unequal, those opposite the posterior styles the largest, anthers opposite the lateral sepals sterile or sometimes those opposite the anterior-lateral sepals with the connective enlarged and with one or two reduced locules; fertile anthers pubescent or sometimes glabrous. Anterior style 1.5–3.5 mm long, shorter than the posterior two, glabrous or sometimes with a few hairs near the stigma; apex 0.9–1.7 mm long including a spur 0.6–1.4 mm long, linear or expanded proximally and triangular to rhombic, 0.3–1.2 mm wide, folioles absent. Posterior styles 2.1–5.8 mm long, glabrous or sometimes with a few hairs near the stigma, lyrate; apex 0.4–0.7 mm long including a spur up to 0.2 mm long or blunt, ca 0.1 mm wide, folioles absent. Dorsal wing of samara 1.5–2 cm long, 0.5–1 (–1.3) cm wide, upper margin with a tooth; nut smooth or with prominent ribs; embryo ovoid, ca two times as long as wide.

Phenology. Collected in flower and fruit throughout the year.

Distribution. Cuba and the Lesser Antilles south to Martinique; on limestone and serpentine outcrops, in coastal thickets, pastures, and palm barrens; sea level to 500 m.

REPRESENTATIVE SPECIMENS. CUBA. Camagüey: savanna S of Sierra Cubitas, *Shafer 514* (NY); Camagüey to Santayana, *Britton 2355* (NY). Havana: near Havana, *Shafer 85* (CM, NY); Cojimar, *Killip 13819* (US). Mantanzas: near mouth of the Bueyvaca, *Britton & Wilson 60* (NY); vicinity of Mantanzas, gorge of the Yunuri, *Britton et al. 247* (CM, F, NY). Oriente: vicinity of Guantánamo, *Britton 1897* (NY); Río Seboruco to falls of Río Mayari, *Shafer 3689* (NY, US); Ensenada de Mora, *Britton et al. 13032* (NY, US). Pinar del Río: Corrientes Bay, *Britton & Cowell 9897* (NY); Sierra de

Anafe, *Britton et al. 10340* (NY). Santa Clara: Ciento Viejo Arroyo, 12½ km E of Santa Clara, *Howard 5088* (GH, NY); Limones, Soledad Cienfuegos, *Jack 5873* (A, CAS, F, LE, S, US). Isla de Pinos: Vivijagua, *Britton et al. 15025* (NY). Without definite locality: *Wright 2153* (G, GOET, LE, MO, NY, P, S, US, W); *Wright 2154* (G, GH, GOET *p.p.*, MO, P).—ANGUILLA. *Boldingh 3513* (U), *Howard & Kellogg 19080* (MICH), *LeGallo 2499* (NY), *Proctor 18581* (A).—ST. MARTIN. *Arnoldo 3433* (U), *Boldingh 3286* (U).—ST. BARTHÉLEMY. *LeGallo 2212* (A).—BARBUDA. *Box 684* (MO, US), *Cowan 1648* (GH, NY, US), *Howard 18518* (A).—ST. KITTS. *Barneby 17782* (MICH, NY), *Britton & Cowell 750* (NY, US).—ANTIGUA. *Rose et al. 3275* (NY, US), *Sauer 2087* (F), *Smith 10494* (A, NY, S, US).—MONTSERRAT. *Proctor 19193* (A), *Shafer 616* (F, NY, US).—GUADELOUPE. *Duss 2413* (F, GH, MO, NY, US), *Questel 1470* (P, US).—LES SAINTES. *Stehlé 1691* (NY).—DOMINICA. *Beard 1459* (GH, NY, S, US), *Stern & Wasshausen 2539* (US), *Wilbur 7641* (F, LL, MICH, MO, TEX).—MARTINIQUE. *Duss 437* (F, NY, US), *Duss 438* (F, NY).

Stigmaphyllon diversifolium is most reliably distinguished by features of the flowers and inflorescence. The anthers opposite the lateral sepals are sterile (or sometimes those opposite the anterior-lateral sepals have one or rarely two greatly reduced locules), and the styles all lack folioles. Each posterior style curves around its opposing stamen; when these styles are very long, as in plants from the Lesser Antilles, they are conspicuously curled distally. The flowers, usually fewer than 20, are borne in solitary umbels or in dichasia. The pedicels are either sessile or borne on very short peduncles (up to 3.5 mm long).

This species is well named for its leaves, which are highly variable in size, shape, and vesture. The extremes in variation have been recognized as separate taxa. Because they are all linked by intermediates and are conservative in the flower and inflorescence characters, they are not recognized here. The most distinctive segregate is *S. cordifolium,* established by Niedenzu for plants from the Virgin Islands and the Lesser Antilles. These plants tend to be less variable than the Cuban specimens. They usually have ovate laminas which are pubescent below even at maturity, larger leaf glands, and somewhat longer styles; however, specimens similar to the Cuban plants also occur. All specimens recorded from Anguilla and St. Martin have linear leaves; in *Stern & Wasshausen 2539* from Dominica the leaves vary from broadly elliptical to suborbicular.

Stigmaphyllon diversifolium is most often confused with *S. emarginatum,* a species found throughout the West Indies except in Cuba, the Bahamas, and Dominica. It differs from *S. diversifolium* in that its anthers are all fertile and in its unusual posterior styles, which are canaliculate-complicate and erect (never curved or curled around the opposing stamen). The flowers are most commonly arranged in solitary pseudoracemes; the peduncles are ⅓ to equally as long as the pedicels. The leaves and stems are most often glabrous at maturity. *Stigmaphyllon diversifolium* is most similar to the Puerto Rican *S. floribundum;* see that species.

Stigmaphyllon ellipticum (H.B.K.) Adr. Juss., Ann. Sci. Nat. Bot., sér. 2, 13: 290. 1840. *Banisteria elliptica* H.B.K., Nov. gen. sp. 5: 161. 1821 [1822].—TYPE: ECUADOR. Loja: "Loxa" [Loja], *Humboldt & Bonpland s.n.* (holotype: P–HBK!).

Banisteria mucronata DC., Prodr. 1: 589. 1824. *Stigmaphyllon mucronatum* (DC.) Adr. Juss., Arch. Mus. Hist. Nat. Paris 3: 377. 1843. *Stigmaphyllon mucronatum* var. γ *typicum* Nied., Ind. Lect. Lyc. Brunsberg. p. aest. 1900: 4. 1900. *Stigmaphyllon ellipticum* var. γ *typicum* (Nied.) Nied., Pflanzenreich IV. 141(2): 500. 1928.—TYPE: ". . . in Nova-Hispania?," collector unknown (holotype: G–DC, photo: F! MICH!).

Banisteria ternata DC., Prodr. 1: 591. 1824. *Stigmaphyllon ternatum* (DC.) Adr. Juss., Ann. Sci. Nat. Bot., sér. 2, 13: 289. 1840. *Stigmaphyllon mucronatum* var. δ *ternatum* (DC.) Nied., Ind. Lect. Lyc. Brunsberg. p. aest. 1900: 4. 1900. *Stigmaphyllon ellipticum* var. δ *ternatum* (DC.) Nied., Pflanzenreich IV. 141(2): 501. 1928.—TYPE: Sessé and Mociño plate, number 6331.1667 in the Torner Collection of Sessé and Mociño Biological Illustrations at the Hunt Institute for Botanical Documentation.

Banisteria billbergiana Beurl., Kongl. Vetensk. Akad. Handl. 1854: 116. 1854.—TYPE: PANAMA. Colón: "Porto Bello [Portobelo], ad litora insulae Manzinella [Manzanillo]," *Billberg 285* (holotype: S!; isotype: S!).

Stigmaphyllon mucronatum var. α. *nicaraguense* Nied., Ind. Lect. Lyc. Brunsberg. p. aest. 1900: 4. 1900. *Stigmaphyllon ellipticum* var. α. *nicaraguense* (Nied.) Nied., Pflanzenreich IV. 141(2): 500. 1928.—TYPE: NICARAGUA. Matagalpa: 800 m, *Rothschuh 643* (holotype: B, destroyed).

Stigmaphyllon mucronatum var. β. *intermedium* Nied., Ind. Lect. Lyc. Brunsberg. p. aest. 1900: 4. 1900. *Stigmaphyllon ellipticum* var. β. *intermedium* (Nied.) Nied., Pflanzenreich IV. 141(2): 500. 1928.—TYPE: PANAMA. "Río Bayono [Bayano]," Mar 1858, *Wagner s.n.* (*Fasc. 11*) (lectotype, here designated: M!).

Laminas 3.5–15.2 cm long, 2–8.6 cm wide, narrowly to broadly elliptical, sometimes lanceolate to ovate, rarely suborbicular, apex mucronate to attenuate, rarely caudate, base truncate to cordate, sometimes attenuate, (very sparsely sericeous to) glabrate to glabrous above and below, margin eglandular, basal glands prominent, sessile, each 0.5–2 mm in diameter; petioles 0.6–2.8 cm long; stipules triangular, eglandular. Flowers 3–9 (–12) per umbel or sometimes a corymb, these borne solitary or in dichasia or small thyrses. Peduncles (1.5–) 2.5–34 mm long, pedicels 2–13 mm long, inflated, peduncles ½–5 times as long as pedicels; bracts 0.9–2 mm long, triangular, bracteoles 0.7–1.8 mm long, oblong to ovate, eglandular. Limb of anterior-lateral petals (11–) 12–17 mm long, 12–17 mm wide, limb of posterior-lateral petals 10–16 mm long, 12–16.5 mm wide, all orbicular; limb of posterior petal (8–) 11–14.5 mm long, (7–) 10.5–14 mm wide, obovate to broadly elliptical to orbicular; margin of all petals lacerate, lacerate-dentate, lacerate-fimbriate, dentate-fimbriate, or fimbriate, teeth and fimbriae 0.4–1.2 mm long. Stamens unequal, those opposite the lateral sepals the longest and with the connective enlarged and the locules reduced, rarely anthers of those opposite the posterior-lateral sepals sterile; anthers glabrous. Anterior style (2.3–) 2.7–3.8 mm long, shorter than or sometimes subequal to the posterior two, glabrous; apex 1–1.5 mm long, the distal ½–¾ (–⅘) elliptically to ovately to suborbicularly (rarely triangularly) expanded, (0.3–) 0.4–0.7 (–0.8) mm wide, folioles absent. Posterior styles (2.3–) 2.6–3.6 mm long, glabrous, erect; folioles 0.9–1.5 mm long, (0.5–) 0.7–1 mm wide, lunate to broadly so. Dorsal wing of samara 2.1–3.5 cm long, 0.8–1.3 cm wide, upper margin usually with a tooth; nut sometimes with a pair of lateral winglets, commonly only bearing spurs and/or crests or only prominently ribbed; embryo ovoid, ca two times as long as wide.

Phenology. Collected in flower and fruit throughout the year.

Distribution. From southeastern Mexico to northern South America; in evergreen, deciduous, rain, thorn, and pine-oak forest, in second growth, thickets, matorral, and at roadsides and edges of beaches; sea level to 2200 m.

Representative Specimens. Mexico. Campeche: Km 71, camino Escárcega a Candelaria, *Chavelas P. et al. ES–372* (MEXU, MICH); Tuxpeña, *Lundell 975* (A, CAS, F, GH, MICH, MO, NY, US, WIS). Chiapas: 9 mi E of Cintalapa on Mex hwy 190, *Anderson & Laskowski 4221* (ENCB, GH, MICH, MO, NY); Mpio Villa Flores, 14 km N of Villa Flores along rd to Tuxtla Gutiérrez, *Breedlove 24605* (DS, MEXU, MICH, MO, NY); Mpio Solosuchiapa, 2–4 km below Ixhuatán along rd to Pichucalco, *Breedlove 34869* (DS, MEXU, MICH). Oaxaca: gorge of Río Malatengo, *Alexander 150* (MEXU, MICH, NY); dist. Cuicatlán, de Palapa a la Raya, *Conzatti 3789* (MEXU, US); Chivela, *Mell 2251* (NY, US). Quintana Roo: Coba, at Lake Coba, *Lundell & Lundell 7668* (MICH, UTD); a 6 km al N de La Unión, *Téllez 1656* (CAS, MEXU, MO). Tabasco: a 2 km N del camino 25 y a 5.2 km al W de la W-O, Balancan, *Novelo et al. 103* (CAS, MEXU, MO). Tamaulipas: irrigation ditch 3 mi S of Ciudad Mante, *Hill 39* (TEX). Veracruz: Laguna Encantada, 6 km al N de San Andrés Tuxtla, *Calzada 950* (CAS, F, MEXU, MO); Atoyac, *Matuda 1470* (A, GH, MEXU, MICH, MO, US); Mpio Dos Ríos, Cerro Gordo, cerca del Salto del Río Grande, *Ventura A. 2624* (CAS, DS, ENCB, F, MICH, NY, P, TEX, US). Yucatán: Izamal, 1888, *Gaumer s.n.* (F).—Belize. El Cayo: Vaca, *Gentle 2490* (MEXU, MICH, TEX). Toledo: riverbank of Río Grande, *Gentle 4816* (LL, MICH, UTD). Stann Creek: Savannah Forest Station, 16°34′N, 88°20′W, *Hunt 356* (F, US, UTD).—Guatemala: Alta Verapaz: along Río Sebol, downstream from Carizal, *Steyermark 45778* (F, LL). Chiquimula: around Ipala, *Steyermark 30363* (F). El Progreso: Fiscal, *Deam 6172* (F, GH, MICH, US). Escuintla: Escuintla, *Harmon & Dwyer 2985* (F, GH, MO). Huehuetenango: near El Reposo, ca 8 km from Mex. frontier, *Williams et al. 41130* (F). Izabal: between Los Amates and Izabal, *Kellerman 7255* (US); near Quiriguá, *Standley 72347* (F). Jutiapa: vic. of Jutiapa, *Standley 74973* (F, US). Petén: Guayacan, bordering Laguna Guayacan, *Contreras 7371* (LL, UTD); Parque Nacional de Tikal, km 59 del camino de El Renate, *Tún Ortíz 373* (F, MO, NY, US). Santa Rosa: near Cuilapa, *Standley 73536* (F). Suchitepéquez: along Río Madre Vieja, above Patutul, *Standley 62209* (F). Zacapa: Gualan, *Kellerman 5733* (LL, US); Sierra de las Minas, vic. of Río Hondo, *Steyermark 29379* (F).—Honduras. Atlantída: vaguada del Río Cangrejal, 20 km SE de La Ceiba, *Nelson et al. 3390* (MO). Cholutea: Marcovia, 20 km de Cholutea, *Argeñal 171* (MICH). Comayagua: cerca de La Libertad, matorrales del Río Frío, *Molina R. 7027* (F, GH, US). Copán: 1 mi W of Ruinas Copán, *Molina R. & Molina 30851* (F). Cortés: nacimiento del Río Lindo, *Molina R. 5680* (F). El Paraíso: matorral del Río Tenpasenti, cerca del pueblo Tenpasenti, *Molina R. 11917* (F, G, NY, US). Gracias a Dios: arroyada del Río Dursuna, 70 km al O de Puerto Lempira, 15°00′N, 84°13′W, *Nelson 798* (MO). Morazán: near Suyapa, along quebrada Suyapa, *Molina R. 702* (F, GH, MEXU). Santa Bárbara: San Pedro Sula, *Thieme 5168* (GH, US).—El Salvador: Ahuachapán: vic. of Ahuachapán, *Standley 19847* (GH, NY, US). La Libertad: vic. of San Tecla, *Standley 23013* (GH, S, US). La Unión: vic. of La Unión, *Standley 20832* (US). San Salvador: vic. of Tonacatepeque, *Standley 19468* (GH, MO, S, US). Santa Ana: vic. of Metapán, *Standley & Padilla V. 3207* (F). Sonsonate: vic. of Acajutla, *Standley 21973* (GH, US).—Nicaragua: Boaco: Las Pitas, 12°28′N, 85°35′W, *Moreno 10653* (MO). Chontales: rd from Juigalpa NE toward La Libertad, ca 17.4 km NE of Río Mayales, ca 12°12′N, 85°17′W, *Stevens 4188* (MICH). Jinotega: "El Recreo," 4 km al N de Sta Gertrudis, 13°13′N, 85°53′W, *Moreno 7918* (MICH). Madriz: ca 5 km SW of San Juan del Río Coco on rd to Telpaneca, ca 13°31′N, 86°11′W, *Stevens 17672* (MICH). Masaya: Parque Nacional Volcán Masaya, on N flank of Volcán Santiago, *Neill 2844* (MICH, MO). Matagalpa: E side of Río Tuma between bridge and Río Yasica, ca 13°03′N, 85°44′W, *Stevens 19188* (MO). Nueva Segovia: a 6 km del Jícaro, carretera a Murra, 13°44′N, 86°05′W, *Moreno 8308* (MICH). Río San Juan: 10 km al SSE de San Miguelito, sobre la carretera a San Carlos, *Sandino 5038* (MO). Zelaya: Monkey Point, 11°36′N, 83°40′W, *Moreno 12359* (MO); ca 2.5 km NW of Rama, ca 12°10′N, 84°14′W, *Stevens 17465* (MO).—Costa Rica. Alajuela: Canton Atenas, Angeles de Atenas, barranca del Río Grande, *Smith 2446* (GH, US). Guanacaste: ca 10–20 km NE of Liberia on Camino Santa María, *Utley & Utley 3114* (DUKE, MICH). Limón: vic. of Westfalia, S of Limón, *Almeda et al. 3225* (CAS, MICH). Puntarenas: Cabo Blanco Nature Reserve, S tip of Nicoya peninsula, 9°35′N, 85°6′W, *Burger & Liesner 6649* (F); near Rincón de Osa, *Liesner 2214* (MO). San José: from Palmital to San Ignacio, *Khan et al. 193* (MICH).—Panama: Bocas del Toro: Isla Colón, vic. of Chiriquí Lagoon, *von Wedel 2828* (GH, MICH, MO, NY). Canal Zone: near Gatún Lake, *Croat 4707* (F, MO, NY); near Salamanca Hydrographic Station, *Dodge et al. 16966* (G, MO, S, U); Barro Colorado Island, *Foster 1320* (F, GH, MICH). Chiriquí: Volcán dist. near Las Lagunas, *D'Arcy 10054* (MICH, MO, NY, U); Burica peninsula, N of San Felix, *Mori & Kallunki 6024* (MICH, MO, NY, US). Coclé: vic. of El Valle, *Allen 1777* (MO). Colón: María Chiquita, *Ebinger 434* (F, GH, MO). Darién: Río Chucunaque, above Yaviza, *Gentry 13478* (COL, F, MICH, MO). Herrera: above Chapo de las Minas, *Folsom et al. 7005* (MO, MICH). Los Santos: Los Teretos, *Dwyer 2438* (MO, US). Panamá: Cerro Jefe, *D'Arcy 9733* (LL, MO, P, TEX). San Blas: Ailigandí,

Dwyer 6858 (MO). Veraguas: between Santa Fe and Escuela Agrícola Alto Piedras, *Croat & Folsom 33836* (CAS, MO, TEX).

Stigmaphyllon ellipticum is very common throughout the Mexican and Central American lowlands and is easily distinguished from all other species. The leaves are usually elliptical, glabrate to glabrous, and have rather short petioles (less than 3 cm long). The flowers are large and clustered in few-flowered umbels. The inflated pedicels are usually shorter than the peduncles in plants from Mexico to Costa Rica; in plants from Panama they are commonly subequal. The anterior style lacks folioles but is somewhat laterally expanded; the posterior styles bear lunate folioles.

Stigmaphyllon emarginatum (Cav.) Adr. Juss., Ann. Sci. Nat. Bot., sér. 2, 13: 290. 1840. *Banisteria emarginata* Cav., Diss. 9: 425. 1790.—TYPE: Plate 249 in Cav., Diss. 9. 1790 (lectotype, designated by Niedenzu, 1899).

Banisteria periplocifolia Desf. ex DC., Prodr. 1: 589. 1824. *Stigmaphyllon periplocifolium* (Desf. ex DC.) Adr. Juss., Ann. Sci. Nat. Bot., sér. 2, 13: 290. 1840.—TYPE: PUERTO RICO. *Bertero s.n.* (G–DC, microfiche MICH!).

Triopteris lingulata Poiret in Lam., Encycl. 8: 104. 1808. *Stigmaphyllon lingulatum* (Poiret) Small, N. Amer. fl. 25(2): 140. 1910.—TYPE: DOMINICAN REPUBLIC. "de St. domingue," collector unknown (holotype: P–LAM!).

Banisteria umbellulata DC., Prodr. 1: 588. 1824.—TYPE: DOMINICAN REPUBLIC: "in Sancto Domingo," *Bertero s.n.* (holotype: G–DC, microfiche, photo: MICH!).

Banisteria periplocifolia α *subovata* DC., Prodr. 1: 589. 1824.—TYPE: unknown.

Banisteria periplocifolia β *angustifolia* DC., Prodr. 1: 590. 1824.—TYPE: specimen in herb. Balbis (TO).

Banisteria microphylla Hamilton, Prodr. fl. Ind. occ. 40. 1825.—TYPE: specimen in herb. Desvaux, fide Adr. Jussieu, 1843 (P?).

Stigmaphyllon emarginatum f. II. *parvifolium* Nied., Ind. Lect. Lyc. Brunsberg. p. hiem. 1899–1900: 7. 1899.—TYPE: JAMAICA. Prope Kingston, *Oersted s.n.* (lectotype, here designated: C!).

Stigmaphyllon periplocifolium f. II. *intermedium* Nied., Ind. Lect. Lyc. Brunsberg. p. hiem. 1899–1900: 7. 1899.—TYPE: JAMAICA. *McNab s.n.* (lectotype, here designated: GOET!).

Stigmaphyllon periplocifolium f. III. *microphyllum* Nied., Ind. Lect. Lyc. Brunsberg. p. hiem. 1899–1900: 7. 1899.—TYPE: HAITI. *Bertero 28x* (holotype: B, destroyed).

Stigmaphyllon periplocifolium f. IV. *sericans* Nied., Verz. Vorles. Ak. Braunsberg W.-S. 1912–1913: 24. 1912. *Stigmaphyllon lingulatum* var. *sericans* (Nied.) Nied. in Urban, Symb. Antil. 8: 336. 1920.—TYPE: HAITI. Gonaives, *Buch 616* (holotype: B, destroyed).

Stigmaphyllon haitiense f. 1. *ovatum* Urban & Nied. in Urban, Symbol. Antil. 7: 243. 1912.—TYPE: HAITI. *Christ 1772* (holotype: B, destroyed).

Stigmaphyllon haitiense f. 2. *linearis* Urban & Nied. in Urban, Symbol. Antil. 7: 243. 1912.—TYPE: HAITI. *Christ 1771* (holotype: B, destroyed).

Stigmaphyllon rubrinervum Alain, Mem. New York Bot. Gard. 21(2): 122. 1971.—TYPE: *Liogier 11863* (holotype: NY!; isotypes: GH! P! US!).

Laminas 1.1–13 cm long, 0.5–10.5 cm wide, extremely variable: linear, lanceolate, oblong, elliptical, ovate, or sometimes suborbicular, apex mucronate-emarginate or sometimes mucronate, base truncate to cordate, sometimes oblique, glabrate to glabrous above and below or sometimes sparsely sericeous below or rarely sericeous below, margin eglandular, basal glands prominent, sessile, each 0.3–1.2 mm in diameter, sometimes pegshaped and up to 0.5 mm high, or gland sometimes absent; petioles 0.2–2 (–3) cm long; stipules triangular to sublinear, eglandular. Flowers (6–) 15–25 (–35) per open to congested pseudoraceme or sometimes an umbel or rarely a corymb, these usually borne solitary, sometimes in dichasia. Peduncles 1.3–25 mm long, pedicels 3–23 mm long, terete, peduncles ⅓ as long as to equalling the pedicels; bracts 1–2.4 mm long, narrowly triangular, bracteoles 0.6–1.3 mm long, linear to narrowly triangular, eglandular. Limb of lateral petals 7.5–11 mm long and wide, orbicular, limb of posterior petal 6.5–9.5 mm long and wide, broadly ovate to orbicular to oblate, all with the margin erose. Stamens unequal, those opposite the posterior styles the largest, or sometimes stamens opposite the styles subequal, those opposite the lateral sepals with the connective enlarged and the locules reduced; anthers glabrous or sparsely pubescent. Anterior style 2–2.8 mm long, shorter than the posterior two, glabrous; apex 0.5–0.7 mm long including a spur up to 0.4 mm long or blunt, folioles absent. Posterior styles 2.5–3.6 mm long, glabrous, canaliculate-complicate, erect; apex 0.5–1 mm long including a spur up to 0.3 mm long or blunt, folioles absent. Dorsal wing of samara 1.6–2.2 cm long, 0.7–0.9 cm wide, upper margin with a tooth; nut ribbed and commonly bearing spurs and/or crests; embryo ovoid, ca two times as long as wide. Fig. 3.

Phenology. Collected in flower and fruit throughout the year.

Distribution. Jamaica, Hispaniola, Puerto Rico, Virgin Islands, and the Lesser Antilles south to Martinique, not reported from Dominica; on limestone and serpentine outcrops, common in coastal thickets; sea level to 1500 m.

Representative Specimens. Jamaica. St. Andrew: Palisadoes, *Yuncker 17293* (F, G, MICH, MO, S); Jack's Hill, *Yuncker 18144* (F, G, MICH, MO, S). St. Catherine: Spanish Town Rd, *Harris 9232* (F, NY, US); Longville Park to Old Harbour Bay, *Harris 11947* (F, MO, NY, S, US). St. James: Montego Bay to Round Hill Bluff, *Harris 10350* (F, NY, US).—Haiti. Massif des Matheux, Thomazeau, Morne à Cabrites, *Ekman H930* (F, MICH, S); Massif de la Selle group, Morne des Commissaires, Anses-à-Pitre, *Ekman H6712* (A, G, NY, S, US); Massif du Nord, Vallière, *Ekman H9942* (G, LL, S, US); base of Morne à Cabrites, *Holdridge 1077* (F, GH, MICH, NY); Dept. de l'Artibonite, vic. of Ennery, *Leonard 9713* (GH, S); vic. of Port de Paix, *Leonard & Leonard 12352* (GH, NY, US); vic. of Jean Rabel, E of Bord du Mer, *Leonard & Leonard 13613* (A, GH, US); Tortue Island, vic. of Basse Terre, *Leonard & Leonard 14045* (A, US).—Dominican Republic. Prov. Azua: E of Azua, *Howard & Howard 8649* (GH, MICH, NY, S); Prov. Barahona: Barahona, *Fuertes 21* (BR, F, G, GH, MO, NY, P, S, U, W); Prov. Monte Christi: near Puerto Libertador, Manzanilla Bay, *Howard & Howard 9667* (GH, NY, S); Prov. Samanà: Los Bañaderos Prietos, *Ekman H15123* (A, NY, S); Prov. Santiago: dist. San José de las Matas, Magua, *Valeur 961* (C, G, LL, MO, NY); Prov. Seibo: vicinity of Higüey, *Howard 9752* (A, MICH, NY); prope Constanza, *von Türckheim 3246* (BR, F, G, GH, M, MO, NY, S, U, US, W).—Puerto Rico. Culebra Island, *Britton & Wheeler 44* (F, NY); vic. of Coamo Springs, *Britton et al. 5960* (G, NY); Condado, *Britton et al. 6632* (G, NY); Guanica, *Liogier 10785* (GH, NY); prope Salinas de Cabo Rojo, *Sintensis 584* (G, GH, GOET, M, P, S); without locality, *Heller & Heller 474* (F, NY).—St. Thomas. *Britton & Shafer 378* (C, F, MO, NY); *Eggers 390* (BR, CAS, G, GOET, M, P, W); *Wydler 40* (BR, F, G).—St. John: *Britton & Shafer 515* (NY).—Tortola. *Britton & Shafer 871* (NY); *D'Arcy 793* (A).—Anegada. *Britton & Fishlock 1045* (NY); *D'Arcy 4863* (MO).—Virgin Gorda. *Fishlock 68* (NY); *Gillis 5825* (A, MSC).—St. Croix. *Hunnewell 20114* (GH); *Ricksecker 154* (F, GH, MO, NY).—Anguilla. *Howard & Kellogg 19053, 19057* (MICH).—St. Martin. *Boldingh 2629* (NY, U); *Stoffers 2673* (A, U).—St. Barthélemy. *Questel 54* (NY, P), *630* (NY).—St. Eustatius. *Boldingh 96, 191* (U).—Barbuda. *Box*

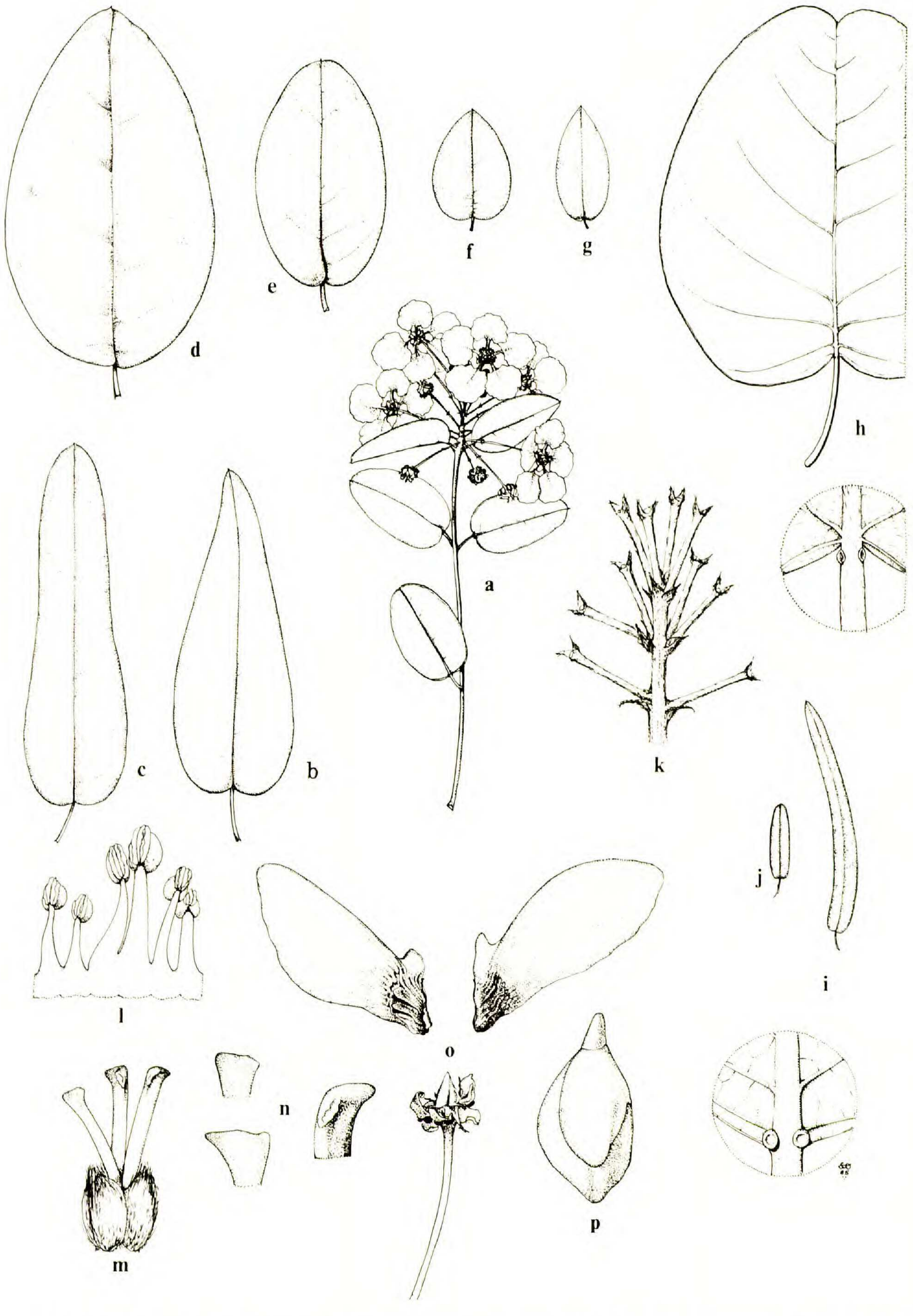


FIG. 3. *Stigmaphyllon emarginatum.* a. Flowering branch (×0.5). b–j. Leaves (×0.5); detail of base (h, ×2.5; j, ×5). k. Inflorescence axis with persistent peduncles (×2.5). l. Section of androecium, anterior stamen on extreme left, posterior stamen on extreme right (×5). m. Gynoecium (×5). n. Apical portion of styles, posterior style on right, anterior style on left (×10). o. Samaras and torus (×1.5). p. Embryo (×5). (Based on: a, k, *Valeur 416;* b, *Yuncker 17293;* c, *Liogier 15180;* d, *Liogier 17597;* e, *Howard & Howard 8649;* f, *Liogier 14820;* g, *Liogier 12442;* h, *Yuncker 18144;* i, *Liogier & Liogier 26900;* j, *Leonard & Leonard 11787;* l, *Yntema 354A;* m, n, *Liogier 12442,* anterior style detail, *Yntema 354A;* o, p, *Yntema 354A,* laterally winged samara on left *Leonard 12352.*)

612 (MO).—NEVIS. *Proctor 19607* (A).—ANTIGUA. *Rose et al. 3497* (NY).—GUADELOUPE. *Bena 1944* (P); *Stehlé 121* (NY).—MARTINIQUE. *Belanger 553* (P); *Duss 439* (NY).

Typical plants of this variable species have glabrous or sometimes sparsely sericeous stems and leaves, and bear ca 15–25 flowers in solitary pseudoracemes. Most distinctive are the posterior styles, which are canaliculate-complicate and erect, and efoliolate; the anterior style is also efoliolate but may bear a short spur. All stamens are fertile. The peduncles vary from ⅓ to equally as long as the pedicels. *Stigmaphyllon emarginatum* is most commonly confused with the often sympatric *S. diversifolium*. In addition to the structure of the styles, *S. diversifolium* differs in having the stamens opposite the lateral sepals sterile and the peduncles much less than ⅓ as long as the pedicels or absent. See *S. diversifolium* for a more detailed separation.

Like *S. diversifolium, S. emarginatum* is conservative in floral characters but bewilderingly variable in leaf shape, sometimes even on the same plant, throughout its range. An astonishing variety is found on Hispaniola alone; seven of the ten leaf shapes illustrated here are based on collections from that island (Fig. 3a, c–g, j; b, h from Jamaica, i from Puerto Rico). The long list of synonyms reflects attempts to subdivide this species on the basis of leaf morphology; however, all the extremes in variation are linked by intermediate forms and are not recognized taxonomically here.

Stigmaphyllon emarginatum is common throughout the West Indies, though absent from Cuba and the Bahamas and not reported from Dominica. The Cuban record, *Ekman 8607,* of Niedenzu (1928) and Liogier (1963) is *S. microphyllum*.

Stigmaphyllon floribundum (DC.) C. Anderson, Syst. Bot. 11: 128. 1986. *Banisteria floribunda* DC., Prodr. 1: 589. 1824.—TYPE: PUERTO RICO. *Bertero s.n.* (holotype: TO, photo: MICH!).

Banisteria tomentosa Desf. ex DC., Prodr. 1: 589. 1824. *Stigmaphyllon tomentosum* (Desf. ex DC.) Nied., Ind. Lect. Lyc. Brunsberg. p. hiem. 1899–1900: 5. 1899, non *Stigmaphyllon tomentosum* Adr. Juss., 1832.—TYPE: specimen made from plants cultivated at the Botanical Garden in Paris (holotype: G–DC, microfiche: MICH!).

Laminas 3.6–18 cm long, 2.5–15.5 cm wide, elliptical or broadly so, oblong, sometimes lanceolate or suborbicular, apex mucronate or mucronate-emarginate, base truncate to slightly cordate or sometimes acute, glabrous above, sericeous to tomentose below, the indumentum sloughed off in patches and older leaves then glabrate to glabrous, margin eglandular, basal glands prominent, sessile, each 0.5–0.8 mm in diameter; petioles (4–) 8–17.5 cm long; stipules narrowly triangular, eglandular. Flowers (10–) 20–25 (–45) per congested or sometimes interrupted pseudoraceme, less commonly a corymb or sometimes an umbel, these borne in large thryses or sometimes in dichasia, rarely solitary. Peduncles absent to 1.5 (–4) mm long, pedicels (8–) 10–22 mm long, terete; bracts (0.6–) 1.1–1.7 mm long, narrowly triangular, bracteoles (0.2–) 0.7–1.4 mm long, narrowly triangular to linear, eglandular. Limb of anterior-lateral petals (8–) 9–11.5 mm long and wide, limb of posterior-lateral petals (8–) 9–10.5 mm long and wide, limb of posterior petal 6.5–9 mm long and wide, all orbicular or suborbicular, margin erose. Stamens unequal, those opposite the posterior styles the largest, or the one opposite the anterior style the largest, or those opposite

the styles subequal, anthers of those opposite the lateral sepals sterile, or sometimes anthers of stamens opposite the anterior-lateral sepals with one or two reduced locules; fertile anthers pubescent or glabrous. Anterior style 2.1–3.2 mm long, shorter than the posterior two, sometimes the styles subequal in length, glabrous; apex 0.6–0.7 (–1.2) mm long including a spur 0.2–0.3 (–0.6) mm long, linear, 0.1–0.2 mm wide, folioles absent. Posterior styles (2–) 2.5–3.6 mm long, glabrous, lyrate; apex 0.5–0.6 mm long including a spur up to 0.2 mm long or blunt, linear, ca 0.1 mm wide, folioles absent. Dorsal wing of samara 1.8–3.2 cm long, 0.6–1.2 cm wide, upper margin with a tooth; nut smooth or sometimes bearing spurs and/or crests; embryo ovoid, ca two times as long as wide. Fig. 4.

Phenology. Collected in flower and fruit from October through June.

Distribution. Known only from Puerto Rico, Virgin Gorda, and St. John; on limestone and serpentine outcrops, common in coastal thickets, barrens, dunes, pastures, and along roadsides; sea level to 1000 m.

Representative Specimens. Puerto Rico. Las Vilyas, NE of Ponce, *Britton & Britton 7459* (NY); Guayama, *Britton & Britton 9095* (NY); near Dorado, *Britton & Britton 9871* (NY); vic. of San Juan, *Britton & Wheeler 288* (NY); vic. of Vega Baja, *Britton et al. 5780* (NY, US); Yauco, *Garber 36* (GH, NY); Caguas, *Goll 380* (US); near Río Piedras, *Heller & Heller 972* (NY); 5 mi NE of Mayaguez, *Heller 4455* (G, GH, MICH, MO, NY, P, US; F is *S. emarginatum*); along rte 687 near Laguna Tortuguero, *Howard & Nevling 16996* (A, U); Maricao, *Liogier 10753* (GH, NY); Cayez, *Liogier et al. 28408, 32547* (UPR); Fajardo, *Martorell & Liogier 28046* (UPR); Mayaguez, Mt. Las Mesas, *Otero 546* (A, CAS, F, MO); Mpio Maricao, Maricao Insular Forest, *Proctor 39192* (JBSD); inter Sabana Grande et Guanica, *Sintensis 3843* (C, G, GH, M, MSC, MO, NY, P, S, US); Manatí, *Sintensis 6716* (F, G, NY, W); 13 km N of Cayey, *Underwood & Griggs 344* (NY, US); near Coamo Springs, *Underwood & Griggs 458* (NY, US).—St. John. *Eggers 3259* (C).—Virgin Gorda. *Fishlock 319* (GH, NY, US); summit and E slope of Virgin Peak, *Smith 10579* (A, NY, S, US).

Typical plants of *S. floribundum* have strikingly large, golden-sericeous compound inflorescences of congested or interrupted pseudoracemes, each composed of 20–25 (–45) flowers. The leaves are also usually large (to 18 cm long and 15.5 cm wide) and golden-sericeous below; this pubescence is shed in patches, and older leaves are often glabrate to glabrous. *Stigmaphyllon floribundum,* which is known only from Puerto Rico and two of the Virgin Islands, is very similar to *S. diversifolium* of Cuba and the Lesser Antilles. In both species the stamens opposite the lateral sepals bear sterile anthers (sometimes the anthers of those opposite the anterior-lateral sepals have one or rarely two greatly reduced locules), and the peduncles are either absent or very short (less than 4 mm long). The apex of the anterior style of *S. diversifolium* may be expanded and triangular to rhombic or may be linear with a spur 0.6–1.4 mm long; the posterior styles diverge at the base and curve distally and in the longest curl around the opposing stamens. In *S. floribundum,* the apex of the anterior style is always linear with a tiny spur 0.2–0.3 (–0.6) mm long; the posterior styles are erect proximally and curve toward but never twist around the opposing stamens. The inflorescences of *S. diversifolium* are never as elaborate as those of *S. floribundum* nor are its leaves ever as large (up to 14.7 cm long and up to 6.8 cm wide). The samaras of *S. floribundum* are also larger than those of *S. diversifolium.*

Small individuals of *S. floribundum* may be confused with the sympatric *S. emarginatum,* whose styles are also efoliolate. This species differs in its canaliculate-complicate posterior styles and in its stamens, which are all fertile. Its peduncles are ⅓ to equally as long as the pedicels.

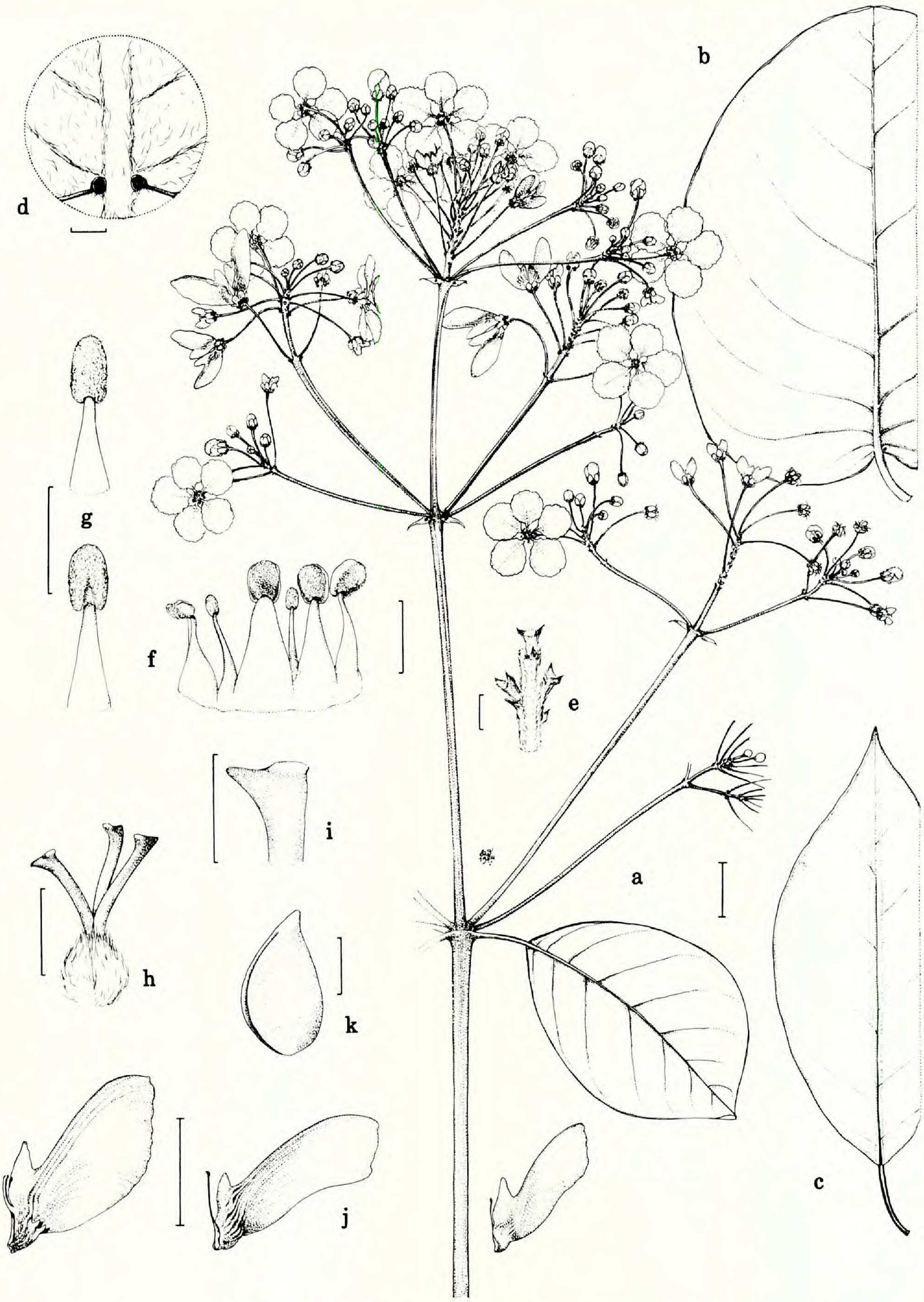


FIG. 4. *Stigmaphyllon floribundum*. a. Habit. b, c. Large leaves. d. Base of leaf and detail of lower surface. e. Section of inflorescence axis with peduncles. f. Section of androecium, posterior stamen on extreme left, anterior stamen on extreme right. g. (above) Abaxial and (below) adaxial view of posterior-lateral stamen. h. Gynoecium. i. Apex of anterior style. j. Samaras. k. Embryo. Scale: for a–c, j, bar = 1.5 cm; for d–f, h, k, bar = 2 mm, for g, i, bar = 1 mm. (Based on: a, e, *Colwell 577;* b, d, *Britton 9871;* c, *Toro 3;* f, g, *Liogier 33781;* h, i, *Tredwell 751;* j, *Richard s.n., Smith 10579, Sintensis 6716;* k, *Sintensis 6716.*)

Collections of *S. floribundum* are usually identified as *S. tomentosum* (Desf. ex DC.) Nied., an illegitimate name (Anderson 1986).

Stigmaphyllon humboldtianum (DC.) Adr. Juss. in St.-Hil., Fl. Bras. merid. 3: 56. 1832 [1833]. *Banisteria tiliaefolia* H.B.K., Nov. gen. sp. 5: 162. 1821 [1822], non *Banisteria tiliaefolia* Vent., 1808. *Banisteria humboldtiana* DC., Prodr. 1: 588. 1824. *Stigmaphyllon tiliifolium* (H.B.K.) Nied., Ind. Lect. Lyc. Brunsberg. p. aest. 1900: 16. 1900. *Stigmaphyllon tiliifolium* var. α. *typicum* Nied., Pflanzenreich IV. 141(2): 497. 1928.—TYPE: COLOMBIA. Bolívar: " . . . inter Carthagenam et Cerro de la Popa," *Humboldt & Bonpland s.n.* (holotype: P–HBK!).

Banisteria variifolia DC., Prodr. 1: 588. 1824.—TYPE: COLOMBIA. Magdalena: "Ad Sanctam-Martham," *Bertero s.n.* (holotype: G–DC, photos: F! GH! MICH! NY!).

Banisteria varia Sprengel, Syst. veg. 2: 386. 1825.—TYPE: COLOMBIA. "Ad fl. Magalen [Magdalena]," *Bertero s.n.* (holotype: B, destroyed).

Stigmaphyllon tiliifolium var. γ. *berteroanum* Nied., Ind. Lect. Lyc. Brunsberg. p. aest. 1900: 17. 1900.—TYPE: COLOMBIA. Magdalena: "Santa Martha," *Bertero 2647+* (lectotype, here designated: M!).

Laminas 6.2–23 cm long, 4.5–24 cm wide, usually cordate to ovate, sometimes elliptical to suborbicular, or sometimes 3–5-lobed, apex mucronate, base cordate or sometimes truncate or briefly attenuate, glabrate to glabrous above, densely pubescent with T-shaped hairs to densely tomentose below, margin with sessile glands and with scattered filiform glands up to 6 mm long, basal glands prominent, sessile, each 1–2.8 mm in diameter; petioles 1.7–10 cm long; stipules triangular, eglandular. Flowers 15–40 (–50) per umbel or corymb, these borne in dichasia, compound dichasia, or thyrses. Peduncles 3.5–9 mm long, pedicels 4–11 mm long, terete, peduncles and pedicels subequal or equal; bracts 0.5–1.3 mm long, triangular, bracteoles 0.5–1.5 mm long, oblong to triangular, eglandular. Limb of anterior-lateral petals 8–8.6 mm long, 7.5–8 mm wide, limb of posterior-lateral petals ca 7.5 mm long, ca 6.5–7 mm wide, all orbicular, margin denticulate or denticulate-fimbriate, fimbriae up to 0.3 (–0.4) mm long; limb of posterior petal 6–6.5 mm long, 4–4.5 mm wide, elliptical to oblong, margin with fimbriae up to 0.5 mm long. Stamens unequal, those opposite the posterior styles the largest, those opposite the lateral sepals with the connective enlarged and the locules reduced; anthers glabrous. Anterior style 2–2.7 mm long, shorter than the posterior two, glabrous; apex 1.2–1.5 mm long, each foliole 1.3–1.6 mm long, 1.4–2 mm wide, square to sometimes subrectangular. Posterior styles 2.7–3 mm long, glabrous, lyrate; folioles 1.3–1.6 mm long, 1.4–2 mm wide, square to sometimes subrectangular. Dorsal wing of samara 3.7–4.5 cm long, 1.2–1.5 cm wide, upper margin with a tooth; nut with a pair of lateral winglets or bearing spurs and/or crests or with only one or two lateral ridges; embryo flattened, ca three times as long as wide. Fig. 5i–o.

Phenology. Collected in flower from September through March, in fruit from November through April.

Distribution. Darién, Panama, and northwestern South America; in dry situations; sea level to 1275 m.

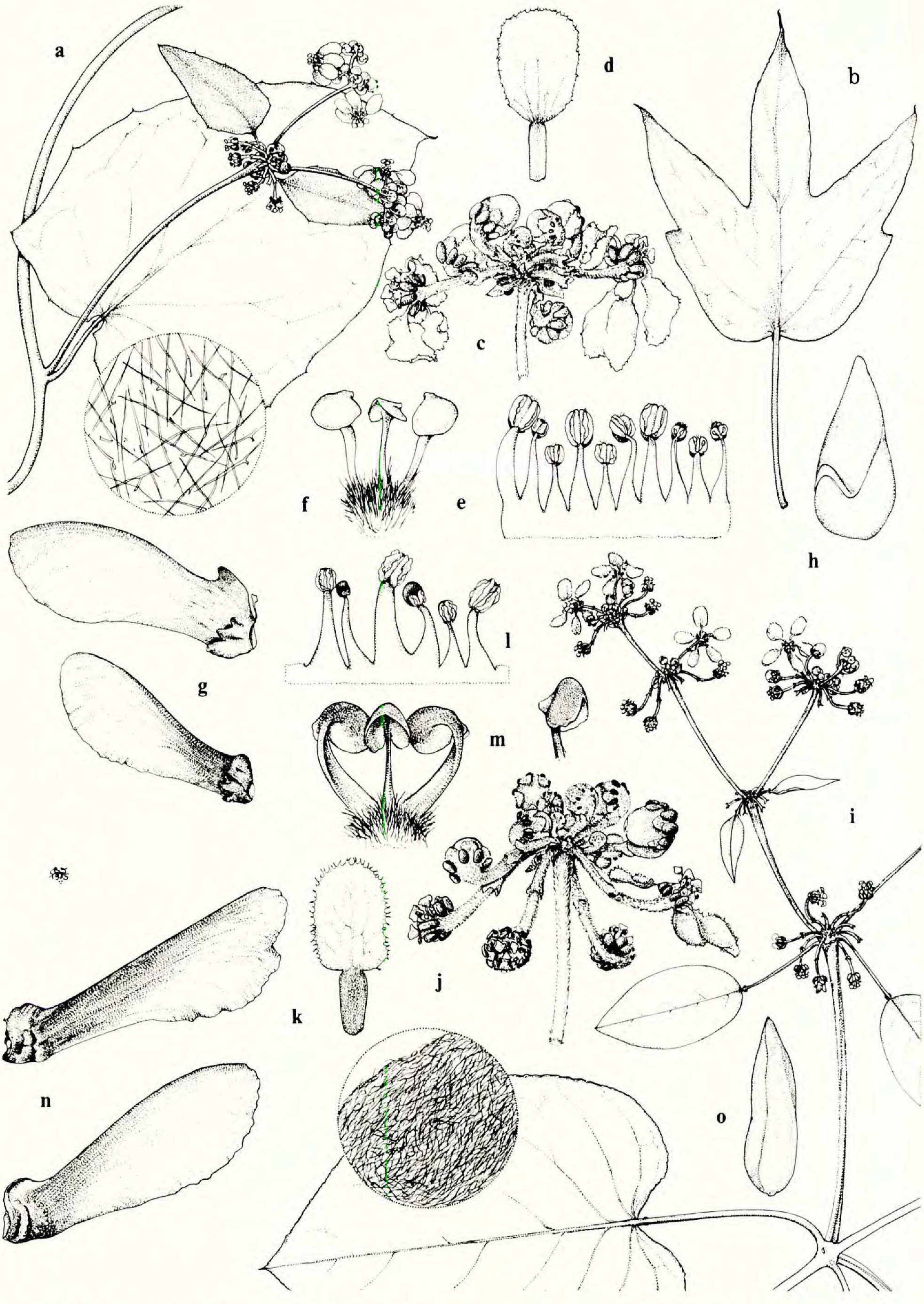


FIG 5. *Stigmaphyllon retusum* and *S. humboldtianum*. a–h, *S. retusum:* a. Flowering branch (×0.5); detail of lower surface of lamina (×15). b. Lobed leaf (×0.5). c. Umbel (×1.5). d. Posterior petal (×2.5). e. Androecium (×5). f. Gynoecium (×5). g. Samaras (×1). h. Embryo (×5). i–o, *S. humboldtianum:* i. Flowering branch (×0.5); detail of lower surface of lamina (×15). j. Umbel (×1.5). k. Posterior petal (×2.5). l. Section of androecium, posterior stamen on extreme left, anterior stamen on extreme right (×5). m. Gynoecium and lateral view of anterior style (×5). n. Samaras (×1). o. Embryo (×3.5). (Based on: a, c–f, *Fryxell & Anderson 3485;* g, *Fryxell & Anderson 3522* (Mexico), *Sandino 2571* (Nicaragua); h, *Pipoly 4542;* i, j, *Smith 1525;* k–m, *de Bruijn 1556;* n, *Romero C. 2045, Fryxell et al. 4400;* o, *Romero C. 2045.*)

REPRESENTATIVE SPECIMENS. PANAMA. Daríen: trail between Pinogana and Yavisa, *Allen 267* (A, F, GH, MO); between Río Jesús and Sabado, *Hammel 1348* (MO); Río Jaqué valley, 7°27′N, 78°05′W, *Knapp & Mallet 3203* (MICH); Chepijana dist., Tucute, *Terry & Terry 1376* (F, GH, MO); Marranganti and vicinity, *Williams 987* (NY).

Stigmaphyllon humboldtianum, a species of northern Colombia and northwestern Venezuela, extends into southern Panama. It is sometimes listed in floras under the illegitimate name *S. tiliifolium.* Reports from Mexico and most of Central America are based on misidentified collections of *S. lindenianum,* which occurs in Darién, Panama, and especially of the variable *S. retusum,* which does not. *Stigmaphyllon humboldtianum* is readily separated from these species by its glabrous anthers; those of *S. lindenianum* and *S. retusum* are pubescent. The embryos of *S. humboldtianum* are unusual in that they are flattened; those of most species, including *S. lindenianum* and *S. retusum,* are ovoid. The leaves of *S. lindenianum* are sericeous below; those of *S. humboldtianum* and *S. retusum* have T-shaped hairs or are tomentose below.

Stigmaphyllon hypargyreum Tr. & Pl., Ann. Sci. Soc. Nat. Bot., sér. 4, 18: 318. 1862.—TYPE: PANAMA. *Duchassaing s.n.* (holotype: P!).

Laminas 7–17.5 cm long, 4.5–12 cm wide, elliptical to ovate or rarely suborbicular, apex acuminate-mucronate, base cordate to truncate or sometimes attenuate, glabrate to glabrous above, densely silvery sericeous below, margin eglandular or with scattered sessile glands, basal glands prominent, sessile, each 1.5–2 mm in diameter; petioles 2.3–7 cm long; stipules narrowly triangular to sublinear, eglandular. Flowers (15–) 20–25 per umbel, these borne in dichasia or small thyrses. Peduncles 2–4 mm long, pedicels 4–7 mm long, terete, peduncles ½–⅔ as long as pedicels; bracts 1.1–2 mm long, triangular, bracteoles 0.9–1.4 mm long, subsquare to parabolic, eglandular. Limb of anterior-lateral petals ca 8–9 mm long and wide, limb of posterior-lateral petals ca 4.5 mm long and wide, all orbicular, margin erose or denticulate or sometimes with fimbriae up to 0.2 (–0.3) mm long; limb of posterior petal ca 4.5 mm long, ca 3.5 mm wide, broadly elliptical, margin erose or denticulate or sometimes with fimbriae up to 0.2 (–0.3) mm long. Stamens unequal, that opposite the anterior style larger than those opposite the posterior styles, those opposite the anterior-lateral sepals usually the longest (sometimes subequal to that opposite the anterior style) and with the connective enlarged and the locules reduced; anthers glabrous. Anterior style 3.4–3.7 mm long, longer than the posterior two, glabrous; apex 1–1.2 mm long, each foliole 0.8–1.1 mm long, ca 0.6 mm wide, oblong to triangular. Posterior styles 3–3.5 mm long, glabrous, lyrate; folioles 1–1.4 mm long, 0.8–1 mm wide, oblong to obovate. Dorsal wing of samara 3.5–4.2 cm long, at the nut 0.3–0.4 cm wide and flared distally to 1.1–1.4 cm wide, upper margin without a tooth; nut sometimes with a pair of lateral winglets, more commonly bearing spurs and/or crests; embryo ovoid, ca two times as long as wide.

Phenology. Collected in flower from October through July, in fruit from December through April.

Distribution. Canal Zone, San Blas, and Darién, Panama, and Colombia; in moist tropical forest, at forest edge, river margins, in clearings and scrub, and along roadsides; sea level to 350 m.

REPRESENTATIVE SPECIMENS. PANAMA. Canal Zone: between Farfan Beach and Palo Seco, *Hunter & Allen 440* (F, G, MO, U); ca 1 mi SW of Cocoli in the Rodman Naval Ammunition Depot, *Wilbur et al. 12871* (F, NY, US); rd from Cocoli to Contractor's Hill, *Tyson & Lazor 6164* (MO); Pipeline Road, 3–5 mi from Gamboa, *Gentry 2415* (F, MO, NY); Barro Colorado Island, *Croat 7226* (F, MO, NY), *Wilson 156* (F), *Woodworth & Vestal 621* (A, F, MO). Darién: Ensenada del Guayabo, 18 km SE of Jaqué, *Garwood et al. 158* (MICH, MO). San Blas: Ailigandí, *Hammel & D'Arcy 5029* (MICH).

Stigmaphyllon hypargyreum is named for the silvery sericeous pubescence on the lower leaf surfaces, which is so dense that the epidermis is obscured. It is one of the two species in our area in which the anterior style and its opposing stamen are larger than the posterior styles and their opposing stamens. The other species is *S. puberum,* whose leaves are sericeous or very sparsely so below; the epidermis is always visible. The two also differ in their samaras. Those of *S. hypargyreum* are of the type most common in the genus. The dorsal wing is flared and widest beyond the midpoint, but it differs from most other species in that it is greatly narrowed at the point of insertion. The nut commonly bears spurs and/or crests or sometimes lateral winglets. In *S. puberum* the dorsal wing encircles the nut and tapers distally; the nut is smooth or at most ribbed.

The only other species in our area whose leaves may be so densely pubescent below is *S. pseudopuberum* of Chiapas, Mexico, and adjacent Guatemala. It has small flowers with subequal, efoliolate styles and subequal stamens.

Stigmaphyllon laciniatum (Ekman ex Nied.) C. Anderson, comb. nov. *Stigmaphyllon angulosum* f. *laciniatum* Ekman ex Nied. in Urban, Arkiv Bot. 22A(17): 19. 1929.—TYPE: HAITI. Île de la Gonâve, *Ekman 8820* (holotype: B, destroyed; isotypes: NY! S! US!).

Laminas 3–12 cm long, 4–11 cm wide in outline, laciniate, apex of each division mucronate, base cordate, sparsely sericeous to glabrate above, sericeous to sparsely so to glabrate below, margin with sessile glands and filiform glands up to 2.5 mm long, basal glands prominent, sessile, each 1–1.7 mm in diameter; petioles 1–5 cm long; stipules triangular, eglandular. Flowers 13–22 per corymb or open to congested, sometimes interrupted pseudoraceme, these borne in dichasia or compound dichasia or sometimes solitary. Peduncles 2.3–7.5 mm long, pedicels 4–7 mm long, terete, peduncles usually shorter than but sometimes subequal to the pedicels; bracts 1–1.5 mm long, triangular, bracteoles 1.1–1.7 mm long, broadly triangular, eglandular. Limb of anterior-lateral petals 11–12 mm long and wide, limb of posterior-lateral petals ca 10 mm long and wide, limb of posterior petal ca 9 mm long and wide, all orbicular, margin denticulate or entire near the claw, distally with fimbriae up to 0.4 mm long. Stamens unequal, those opposite the posterior styles the largest, anthers of those opposite the anterior-lateral sepals sterile, those opposite the posterior-lateral sepals with the connective enlarged and the locules reduced; anthers glabrous. Anterior style 3–3.2 mm long, shorter than the posterior two, glabrous; apex ca 0.7 mm long, each foliole 1.3–1.4 mm long, 1.2–1.3 mm wide, parabolic. Posterior styles 3.6–3.7 mm long, glabrous, lyrate; folioles 1.7–2 mm long, ca 1.7 mm wide, subsquare. Dorsal wing of samara 1.5–1.8 cm long, 0.5–0.7 cm wide, upper margin with a tooth; nut with a pair of lateral winglets or sometimes only with a narrow ridge on each side; embryo ovoid, ca two times as long as wide.

Phenology. Collected in flower and fruit in July and August.
Distribution. Endemic to Île de la Gonâve, west of Haiti.

ADDITIONAL SPECIMENS EXAMINED. HAITI. Île de la Gonâve: *Ekman 8670* (NY–fragment, S); *Eyerdam 63* (F, GH, US), *219* (A, F, GH, MO, NY, US).

Stigmaphyllon laciniatum was first described as a form of *S. angulosum* of Hispaniola. While it is probably most closely related to that species, it differs from it consistently and is here accorded specific status. It is the only species in the genus to have laciniate leaves. *Stigmaphyllon angulosum* has sinuate-lobate leaves, also unique in the genus. The two species are similar in their flowers though those of *S. laciniatum* are somewhat smaller. In *S. laciniatum* the stamens opposite the anterior-lateral sepals bear sterile anthers; in *S. angulosum* all anthers are fertile. The two also differ in the size of their samaras. The dorsal wing is 1.5–1.8 cm long in *S. laciniatum* and 2.8–4.5 cm long in *S. angulosum*.

Stigmaphyllon lindenianum Adr. Juss., Arch. Mus. Hist. Nat. Paris 3: 362. 1843.
Stigmaphyllon lindenianum subsp. a. *typicum* Nied., Pflanzenreich IV. 141(2): 499. 1928. *Stigmaphyllon lindenianum* var. β. *jussieuanum* Nied., Pflanzenreich IV. 141(2): 499. 1928, nom. superfl.—TYPE: MEXICO. Tabasco: Teapa, *Linden s.n.* (holotype: P!; isotype?: G!).
Stigmaphyllon tiliifolium var. δ. *sericans* Nied., Ind. Lect. Lyc. Brunsberg. p. aest. 1900: 17. 1900. *Stigmaphyllon sericans* (Nied.) Small, N. Amer. fl. 25(2): 144. 1910.—TYPE: HONDURAS. Santa Bárbara: Pedro Sula, 800 ft, *Thieme 5164* (lectotype, here designated: US!; isolectotypes: GH! NY!).
Stigmaphyllon lindenianum var. α. *yucatanum* Nied., Ind. Lect. Lyc. Brunsberg. p. aest. 1900: 18. 1900.—TYPE: MEXICO. Yucatán, *Gaumer 408* (holotype: B, destroyed; isotypes: A! BR! C! CAS! F! MICH! MO! NY! US! W!).
Stigmaphyllon tiliifolium var. δ. *sericans* f. II. *grandifolia* Nied., Pflanzenreich IV. 141(2): 498. 1928.—COSTA RICA. Cartago: Tuis, Turrialba, 650 m, *Tonduz 11454* (lectotype, here designated: F!; isolectotypes: BR! M! MICH! US!).

Laminas (4.5–) 5–18.5 cm long, 4–15.5 cm wide, triangular to ovate to cordate, sometimes 3–5-lobed or elliptical, apex mucronate to caudate, base cordate to subtruncate, glabrate to glabrous above, sericeous to sparsely so below, margin with scattered sessile glands and/or with scattered filiform glands up to 2.5 mm long, basal glands prominent, sessile, each 1.2–3.2 mm in diameter; petioles (1.1–) 1.6–8.5 (–10) cm long; stipules triangular, eglandular. Flowers (9–) 12–35 per umbel or corymb, these borne in dichasia, compound dichasia, or small thyrses. Peduncles 2.7–8.5 mm long, pedicels (3.5–) 3.8–9.5 (–10.5) mm long, terete, peduncles usually longer than but sometimes shorter than or equalling the pedicels; bracts 0.8–15 mm long, narrowly to broadly triangular, bracteoles 0.7–1.4 mm long, oblong or sometimes broadly triangular, eglandular. Limb of anterior-lateral petals 7–9.3 (–10) mm long, 6–8.5 (–9) mm wide, limb of posterior-lateral petals 5.5–8.5 mm long, 5–6.5 mm wide, all obovate to orbicular, margin erose, denticulate, or denticulate-fimbriate, fimbriae up to 0.2 (–0.3) mm long; limb of posterior petal 5.8–7 (–7.5) mm long, 4–5 mm wide, elliptical to obovate, margin erose, denticulate-fimbriate, or with fimbriae up to 0.2 (–0.3) mm long. Stamens unequal, those

opposite the posterior styles the stoutest, equally long or slightly longer than those opposite the lateral sepals, those opposite the lateral sepals with the connective enlarged and the locules reduced; anthers pubescent, those with reduced locules glabrous. Anterior style (1.8–) 2–3 mm long, shorter than the posterior two, glabrous; apex 0.8–1.5 mm long, each foliole 0.5–1 mm long, 0.7–1.1 mm wide, triangular to parabolic or sometimes subsquare to narrowly trapezoidal to subrectangular, rarely the folioles reduced and the apex only expanded, rhombic, 0.4–0.5 mm wide. Posterior styles 2.3–3.5 mm long, glabrous, lyrate; folioles 0.9–1.3 (–1.7) mm long, 1–1.5 (–1.7) mm wide, subsquare to subrectangular. Dorsal wing of samara 2–3.5 cm long, 0.6–1.4 cm wide, upper margin usually with a tooth; nut smooth or with 2–3 winglets on each side or bearing spurs and/or crests; embryo ovoid, ca two times as long as wide. Fig. 6a–g.

Phenology. Collected in flower and fruit throughout the year.

Distribution. Atlantic lowlands from southern Veracruz, Mexico, to Panama, in Costa Rica also reported from the Golfo Dulce area, in Panama also in the Pacific lowlands; in tropical deciduous forest, secondary evergreen forest, mangrove swamps, and at roadsides; sea level to 1200 m.

Representative Specimens. Mexico. Chiapas: Mpio Ocozocoautla de Espinosa, 45 km N of Ocozocoautla, *Breedlove 20724* (CAS, ENCB, MICH, MO); Mpio Solosuchiapa, below Ixhuatán along road to Pichucalco, *Breedlove 34871* (CAS, ENCB, MEXU, MICH); Mpio Las Margaritas, confluence of Río Ixcán with Río Lacantum (Río Jataté), *Breedlove 34226* (CAS, MICH, NY). Oaxaca: Mpio Sta María Chimalapa, dist. Juchitán, 4 km al NO del Ejido La Esmeralda, *Delgado S. et al. 952* (CAS, CHAPA, ENCB, F, MEXU, NY). Quintana Roo: NW del entronque Chetumal-F. Carillo Puerto, *Téllez 2013* (MEXU, MO); 21 km al SE de Chunhuhub, *Téllez 2180* (MEXU, MO). Tabasco: Mpio Huimanguillo, KM 35 de la desviación de Huimanguillo hacia Fco. Rueda, *Cowan 2679* (CAS, CHAPA, ENCB, TEX); Mercedes, Balancan, *Matuda 3022* (A, F, MEXU, MICH, NY). Veracruz: La Palma, Catemaco, *Martínez Calderón 2201* (A, CAS, MEXU); Hidalgotitlán, *Vázquez 390* (F, MEXU, MO). Yucatán: SE Kancabconot, *Gaumer 23900* (C, F, G, GH, MO, NY, US); Mpio Tunkas, Quintana Roo, *Vara & Arias 320* (CAS, CHAPA, ENCB, F, MO).—Guatemala. Alta Verapaz: along Río Sebol, downstream from Carizal, *Steyermark 45796* (A, F, LL); Coban, *von Türckheim II–2359* (F, US). Izabal: vic. of Quiriguá, *Standley 24055* (GH, NY, US). Petén: Poptún, carretera para San Luis, *Tún Ortíz 2137* (F, MICH, US).—Belize. Orange Walk: Roaring Creek, *Dwyer & Liesner 12259* (MICH, MO, NY). Stann Creek: Middlesex, *Schipp 468* (A, F, G, GH, MICH, MO, NY, S).—Honduras. Atlántida: along Tela River, between Peñas Gordas and Tela, *Molina R. & Molina 25678* (F, MO, NY, US). Copán: vic. of Copán ruins, *Molina R. & Molina 24605* (F, MO, NY). Cortés: a orillas del Río Lindo, *Molina R. 11828* (F, NY, US, UTD). Islas de la Bahía: Roatán Island, *Molina R. 20698* (F, NY, US). Santa Bárbara: al N de Santa Bárbara, región La Cuesta, *Molina R. 3770* (F).—Nicaragua. Río San Juan: between San Juan del Norte and Delta de San Juan, *Bunting & Licht 837* (DUKE, F, NY, US); Caño El Roble, *Moreno 23367* (MICH); Archipiélago de Solentiname, N Isla La Venada, *Sandino 3603* (MICH). Zelaya: Monkey Point, *Moreno & Sandino 11995* (MICH), *12031* (MO); Caño Montecristo, *Moreno 15191* (MO); Montecristo, N de Barra Punta Gorda, *Sandino 2230* (MO).—Costa Rica. Alajuela: ca 3 km NNE of Bijagua along new rd to Upala, *Burger & Baker 9877* (F, NY). Heredia: Finca La Selva, OTS field station, *Hammel 8398, 8461, 9017, 10016, 10661, 11640* (DUKE). Limón: near Río Catarata, 9°37′N, 82°49′W, *Burger et al. 10415* (CAS, F). Puntarenas: ca 5 km W of Rincón de Osa, Osa peninsula, *Burger & Gentry 8879* (AAU, DUKE, F, MO, U).—Panama. Bocas del Toro: Water Valley, vic. of Chiriquí Lagoon, *von Wedel 1525, 2754* (GH, MO). Canal Zone: Barro Colorado Island, *Croat 7021* (F, MO, NY), *Wetmore & Abbe 220* (F, GH, MO); 4 km NW of Gamboa, *Nee 7582* (CAS, MO, TEX, U); NW shore of Gatun Lake, ca 4 mi S of Río Chares, *Lewis et al. 1817* (MEXU, MO). Chiriquí: Burica Peninsula, 2 km S of Puerto Armuelles, *Busey 475* (F, MO, NY); Paso Canoas to Carras Gordas, 10.5 km N of Paso Lanoas, *Busey 615* (F, MO, NY). Colón: rd from Colón to Porto Belo, 24.6 km E of transisthmian hwy, *Folsom 3730* (MO, MICH); at Quebrada Santa Marta on coast rd 4½ km SW of Pina, *Nee 11717* (F, MO, US); Santa Rita Ridge, ca 15 mi from hwy at Sabanita, *Wilbur & Luteyn 11845* (F, NY, US). Darién: Río Chucunaque, between Río Membrillo and Río Subcuti, *Duke 8609* (MO); Río Ucungati, *Bristan 1172* (MO). Panamá: Río Majé, above first water-

FIG. 6. *Stigmaphyllon lindenianum, S. panamense,* and *S. tonduzii.* a–g, *S. lindenianum:* a. Flowering branch (×0.5). b. Lobed leaf (×0.5), detail of lower surface of lamina (×10). c. Posterior petal (×2.5). d. Section of androecium, posterior stamen on extreme left, anterior stamen on extreme right (×5). e. Gynoecium (×5). f. Samaras (×1). g. Embryos (×5). h–l, *S. panamense:* h. Flowering branch (×0.5), detail of lower surface of lamina (×10). i. Posterior petal (×2.5). j. Gynoecium (×5). k. Androecium (×5). l. Samara (×1). m–o, *S. tonduzii:* m. Gynoecium (×5). n. Samara (×1). o. Embryo (×5). (Based on: a, e, *MacDougall s.n.;* b, c, d, *Reznicek M179;* f, *Cowan 2679, Burger 10415;* g, *Cowan 2024, 3189;* h–k, *Johnston 1301;* l, *Duchassaing s.n.;* m–o, *Meerow et al. 1003.*)

fall, *Croat 34435* (MO); along headwaters of Río Corso (off Río Pacora), *Duke 11937* (MO). San Blas: El Llano-Cartí rd, 9°19′N, 78°55′W, *de Nevers & Pérez 3990* (MICH); Dubaganalla, *Duke 10199* (MO).

Stigmaphyllon lindenianum, one of the most widely distributed species in our area, is common throughout the Atlantic lowlands of southern Mexico and Central America and has also been recorded from the Osa Peninsula of Costa Rica and the Pacific side of Panama. Its relatively small flowers with pubescent anthers and foliolate styles are borne in many-flowered compound inflorescences. The leaves vary from triangular to cordate or sometimes 3–5-lobed. This species is commonly confused with the variable *S. retusum* and also with *S. humboldtianum.* They are most readily separated by their leaves. Those of *S. lindenianum* are sericeous below, i.e., the hairs are straight and tightly appressed, while those of *S. retusum* and *S. humboldtianum* have T-shaped hairs below or are tomentose. Also, the anthers of *S. humboldtianum* are glabrous. The difference in vesture of the lower leaf surface of *S. lindenianum* and *S. retusum* was first pointed out by Morton (1936); however, he applied the name *S. humboldtianum* to *S. retusum* and also preferred to recognize all three taxa as *S. lindenianum.*

In *S. lindenianum* all styles are normally foliolate, but in a few collections from Chiapas (*Laughlin 2905,* DS), Veracruz (*Dorantes 2979,* MEXU, MICH, MO), and Yucatán (*Gaumer 408,* A, BR, C, CAS, F, MICH, MO, NY, US, W) the anterior style bears reduced folioles or lacks folioles and its apex is merely laterally expanded; the degree of reduction may vary even within the same inflorescence. Niedenzu recognized these unusual plants as var. *yucatanum,* based on *Gaumer 408.* Such occasional reduction and loss of the folioles is also known in other species and does not merit taxonomic recognition.

Stigmaphyllon microphyllum Griseb., Pl. Wright. 168. 1860.—TYPE: CUBA. Oriente: Guantánamo, *Wright 93* (holotype: GOET!; isotypes: BR! G! GH! MO! S! US!).

Laminas 0.8–3.7 cm long, 0.4–1.4 cm wide, elliptical to oblong or sometimes obovate, apex mucronate-emarginate, sometimes obtuse, base attenuate or truncate to sometimes subcordate, sparsely sericeous to glabrate to glabrous above, sericeous to sparsely so below, margin eglandular, basal glands stipitate, each 0.2–0.3 mm in diameter, 0.2–0.6 mm long; petioles (0.1–) 0.2–0.4 cm long; stipules narrowly triangular to sublinear, eglandular. Flowers 4 per solitary umbel. Peduncles 3.5–16 mm long, pedicels (0.7–) 0.9–24.5 mm long, terete, peduncles ⅓ as long as to equalling the pedicels; bracts 0.9–14 mm long, triangular to broadly so, bracteoles 0.7–13 mm long, broadly to narrowly triangular, eglandular. Limb of anterior-lateral petals 8.7–9.3 mm long and wide, limb of posterior-lateral petals ca 8.5–9 mm long and wide, limb of posterior petal 6.5–7.5 mm long and wide, all orbicular, margin erose. Stamens unequal, those opposite the posterior styles the largest, those opposite the lateral sepals with the connective enlarged and the locules reduced; anthers pubescent, sometimes sparsely so. Anterior style 2.3–2.8 mm long, shorter than the posterior two, glabrous; apex 0.6–0.8 mm long, each foliole 0.4–0.7 mm long, 0.4–0.5 mm wide, obovate or oblong or parabolic, or rarely the apex only laterally expanded, rhombic, ca 0.5 mm wide. Posterior styles 2.9–3.8 mm long, glabrous, canaliculate-complicate and erect; folioles 0.6–0.7 mm long, 0.4–0.5 mm wide, semielliptical or parabolic or obo-

vate. Dorsal wing of samara 1.6–1.7 cm long, 0.6–0.7 cm wide, upper margin with a tooth; nut commonly bearing spurs and/or crests or smooth; embryo ovoid, ca two times as long as wide.

Phenology. Collected in flower in February, March, October, and December, in fruit in May and December.

Distribution. Endemic to Cuba.

Additional Specimens Examined. Cuba. Oriente: Novaliches, Guantánamo, *Alain 3502* (GH); Guantánamo Bay, *Britton 2252* (NY); Ensenada de Mora, *Britton et al. 12947* (NY), *Britton et al. 13028* (F, MO, NY, US); Novaliches, Guantánamo, *Hioram 2402* (GH, NY); Estación Naval de Caimanera, *Hioram & Ramsden 2339* (NY); vic. of Manzanillo, *Shafer 12348* (NY). Camagüey: Santa Cruz del Sur, *Ekman 8607* (G, NY, S); between Tarafa and Pastilillo, *Ekman 15463* (S). Havana: Batabanó, La Mora, *Ekman 12625* (S).

Stigmaphyllon microphyllum is named for its small leaves, which are up to 3.7 cm long and 1.4 cm wide. The basal leaf glands are usually peg- or nail-like, as in *S. sagraeanum*. It is the only species in our area in which the inflorescence is always a solitary, 4-flowered umbel. The posterior styles resemble those of *S. emarginatum* in that they are canaliculate-complicate but differ by bearing foli-oles. The anterior style is also foliolate though in one collection, *Britton et al. 13028,* each foliole is reduced to a narrow lip.

Stigmaphyllon microphyllum is superficially similar to small-leaved individuals of *S. emarginatum,* which does not occur in Cuba, and has been confused with it (see that species).

Stigmaphyllon ovatum (Cav.) Nied., Ind. Lect. Lyc. Brunsberg. p. aest. 1900: 31. 1900. *Banisteria ovata* Cav., Diss. 9: 429. 1790. *Brachypteris borealis* Adr. Juss., Ann. Sci. Nat. Bot., sér. 2, 13: 291. 1840, nom. superfl. *Brachypteris ovata* (Cav.) Small, N. Amer. fl. 25(2): 138. 1910.—Type. Dominican Republic. *Surian 828* (lectotype, here designated: P–JU!).

Banisteria maritima Rich., Actes Soc. Hist. Nat. Paris 1: 109. 1792.—French Guiana. *LeBlond 45* (holotype: G!).

Banisteria picta H.B.K., Nov. gen. sp. 5: 160. 1821 [1822].—Type: Colombia. "Crescit locis humidis fluminis Sinu, inter Carthagenam et Isthmum Panamensis," *Humboldt & Bonpland s.n.* (holotype: P–HBK!).

Banisteria brachyptera DC., Prodr. 1: 591. 1824.—Type: French Guiana. Cayenne, *Perrotet s.n.* (holotype: G–DC, microfiche: MICH!).

Banisteria calcitrapa Hamilton, Prodr. pl. Ind. occ. 40. 1825.—Type: *Desvaux s.n.* (holotype: P!).

Stigmaphyllon heringerianum de Paula & Alves, Rodriguésia 46: 165. 1978.—Type: Brazil. Maranhão: Rosário, cachoeira de Miranda, estuário do rio Itapecuru, 12 Jan 1976, *de Paula 741* (holotype: UB!).

Laminas 4–12 cm long, 1.5–5.5 cm wide, narrowly elliptical to lanceolate, apex acute, obtuse, or sometimes apiculate, base attenuate or truncate, glabrate to glabrous above, sparsely sericeous below, margin eglandular, basal glands flush, each 0.5–1 mm in diameter; petioles 0.4–1.8 cm long; stipules triangular, eglandular. Flowers (3–) 4 (–6) per umbel, these solitary or borne in dichasia or sometimes in small thyrses. Peduncles 0.2–2.5 mm long, pedicels 15–30 mm long, terete, peduncles much shorter than the pedicels; bracts 1–2.3 (–5.3) mm long, ovate or elliptical, bracteoles 0.8–1.6 mm long, ovate to elliptical or triangular, eglandular. Limb of anterior-lateral petals 11–12 mm long and wide, limb of

posterior-lateral petals 9–12 mm long and wide, limb of posterior petal ca 8.5–10.5 (–11) mm long and wide, all orbicular or broadly obovate, margin erose. Stamens equal in shape, those opposite the anterior-lateral sepals usually the longest, sometimes those opposite the posterior-lateral sepals equally long; anthers equal or subequal, glabrous. Anterior style 2.5–3.7 mm long, equal or subequal to the posterior two, glabrous; apex 1–1.7 mm long, linear, 0.2–0.3 mm wide, folioles absent. Posterior styles 2.6–3.7 mm long, glabrous, erect; apex 1–1.2 mm long, usually 0.1–0.3 mm shorter than apex of anterior style, linear, 0.2–0.3 mm wide, folioles absent. Dorsal wing of samara reduced to an apical crest 4–9 mm high, 5.5–7.5 mm wide; nut bearing 4–6 ridges or winglets (up to 2 mm high, 7 mm wide); embryo circular to horseshoe-shaped.

Phenology. Collected in flower and fruit throughout the year.

Distribution. Atlantic coast from southern Veracruz, Mexico, to northern Brazil, in the West Indies reported from Cuba, Jamaica, Hispaniola, Puerto Rico, Guadeloupe, Martinique, St. Lucia, and Barbados; along seashores and beaches, in mangrove swamps and salt marshes; sea level to 50 m.

Representative Specimens. Cuba. Oriente: Baracoa, *Ekman 4106* (G, S), *Shafer 3912* (F, NY, US), *Wright 2157* (GH, GOET, MO).—Jamaica. Portland: *Hunnewell 15299* (GH). St. Mary: Annotto Bay, *Proctor 23755* (LL, NY). St. Thomas: Morant Point, *Webster & Wilson 5229* (G, MICH, S).—Haiti. Dept. du Nord, Bayenne, *Ekman H2668* (A, F, G, LL, NY, S, US); vic. of St. Louis du Nord, *Leonard & Leonard 14099* (A, NY, US); Bayeux, near Port Margot, *Nash & Taylor 1016* (NY).—Dominican Republic. Samaná peninsula, vic. of Sánchez, *Abbott 516* (GH, US); Prov. Puerto Plata, Puerto Plata, *Ekman 14357* (S, US); Prov. Barahona, *Fuertes 313* (A, F, G, GH, MO, NY, P, S, US, W).—Puerto Rico. Naguabo prope Río Blanco, *Eggers 407* (BR, G, GH, GOET, M, P, W); mouth of Río Santiago, *Liogier & Liogier 28999* (NY, UPR); Vieques Island, *Woodbury V–14* (UPR).—Barbados. *McIntosh 65* (P); *Bovell & Treeman 210* (NY).—Guadeloupe. *Questel 453, 576, 4993* (US); *Stehlé et al. 5515* (US).—Martinique. *Sieber 125* (BR, GOET, M, MO, NY, W); *Duss 1414* (F, GH, MO, NY, US).—St. Lucia. *Proctor 18024* (A); *Sturrock 270* (A).—Mexico. Tabasco: Frontera, *Rzedowski 30035* (MEXU, MICH, MO, P). Veracruz: antes de puente de Alvarado, *Calzada 435* (CAS, GH, MEXU).—Guatemala. Izabal: Puerto Barrios, *Deam 384* (GH, MICH, NY, US).—Belize. Belize: Belize, *Kellerman 5737* (LL, US), *Lundell 4087, 4089* (MICH).—Nicaragua. Río San Juan: San Juan del Norte (Greytown), *Stevens 20824* (MO). Zelaya: Bahía de Bluefields, *Molina R. 2060* (F); La Barra de Punta Gorda, *Moreno 13196, 13201* (MO); Río Kuawantla, 3 km W of Puerto Isabel, *Neill 4576* (MICH); El Bluff, N de El Muelle, *Sandino 2227* (MICH).—Panama. Colón: Chagres, *Fendler 49* (GH, MO, US); Miguel de la Borda, *Croat 10073* (F, MO); trail above Río Indios, *Sullivan 122* (MO). San Blas: vicinity of Cangandi, 9°24′N, 79°24′W, *de Nevers et al. 6442* (MO).

Stigmaphyllon ovatum is an atypical, easily recognized species. The large flowers, borne in groups of (3–) 4 (–6) per umbel, differ from most species in their subequal stamens and subequal, efoliolate but hooked styles. The peduncles are always much shorter than the pedicels. The leaves consist of short petioles, less than 2 cm long, and narrowly elliptical to lanceolate laminas; the basal glands are flush rather than prominent as in all other species in our area. Most unusual is the samara. The dorsal wing is reduced to an apical crest 4–9 mm high. The large (8–11 mm in diameter), usually ribbed nut contains a circular to horseshoe-shaped embryo.

Stigmaphyllon panamense C. Anderson, sp. nov.—Type: Panama. San José Island, Las Perlas Archipelago, ca 55 mi SSE of Balboa, rd to Third Beach, *Johnston 1301* (holotype: GH!; isotype: MO!).

Liana. Laminae 8.2–13 cm longae, 5.5–10.5 cm latae, ovatae vel ellipticae, supra glabrae, subtus pilos T-formes brevissime stipitatos ferentes, margine eglan-

dulosae vel glandulosae. Inflorescentia dichasialis vel thyrsiformis constata ex umbellis, floribus in quaque umbella 13–20. Pedunculi 2.5–7 mm longi; pedicelli 5.5–11 mm longi. Bracteae 1–1.7 mm longae, triangulares; bracteolae 0.7–1.1 mm longae, ovatae vel late ovatae, eglandulosae. Petala lateralia orbicularia, marginibus erosis vel eroso-denticulatis; petalum posticum ellipticum vel late obovatum, margine fimbriata vel denticulato-fimbriata. Stamina heteromorpha, omnia fertilia vel antherae petalis postico-lateralibus oppositae raro steriles; antherae glabrae. Stylus anticus 3–3.2 mm longus, apice 1.7–2.1 mm longo, utroque foliolo 1.4–2.1 mm longo latoque, subquadrato; styli postici 3.9–4.5 mm longi, lyrati, foliolo 1.9–2.8 mm longo latoque, quadrato vel subrectangulari.

Laminas 8.2–13 cm long, 5.5–10.5 cm wide, ovate or elliptical, apex acuminate or acuminate-mucronate, base slightly cordate to truncate, glabrous above, sericeous or with short-stalked (0.05–0.1 mm long) T-shaped hairs below but these sloughed off in patches and old laminas glabrate or glabrous below, margin eglandular or with scattered sessile glands, basal glands prominent, sessile, each 1–1.8 mm in diameter; petioles 2.4–5 cm long; stipules broadly triangular or ovate, eglandular. Flowers 13–20 per umbel, these borne in dichasia or small thyrses. Peduncles 2.5–7 mm long, pedicels 5.5–11 mm long, terete, peduncles (⅓–) ½ (–⅘) as long as pedicels; bracts 1–1.7 mm long, triangular, bracteoles 0.7–1.1 mm long, ovate or broadly so, eglandular. Limb of anterior-lateral petals 12–15 mm long and wide, limb of posterior-lateral petals 10–11.5 mm long and wide, all orbicular, margin erose or erose-denticulate; limb of posterior petal 9–11 mm long, ca 7.5 mm wide, elliptical to broadly obovate, margin fimbriate or denticulate-fimbriate, fimbriae (0.1–) 0.2–0.4 (–0.7) mm long. Stamens unequal, those opposite the posterior styles the largest, those opposite the lateral sepals with the connective enlarged and the locules reduced, sometimes those opposite the posterior-lateral sepals with only one locule or rarely sterile; anthers glabrous. Anterior style 3–3.2 mm long, shorter than the posterior two, glabrous; apex 1.7–2.1 mm long, each foliole 1.4–2.1 mm long and wide, subsquare. Posterior styles 3.9–4.5 mm long, glabrous, lyrate; folioles 1.9–2.8 mm long and wide, square to subrectangular. Dorsal wing of samara ca 3.7 cm long, ca 1.3 cm wide, upper margin with a tooth; nut with a pair of lateral winglets; mature seed not seen. Fig. 6h–l.

Phenology. Collected in flower from December through February and in April; date unknown of only fruiting collection seen.

Distribution. Central Panama and islands in the Gulf of Panama; in thickets and at forest edge; sea level to 50 m.

Additional Specimens Examined. Panama. Canal Zone: Farfan Beach, *Dwyer 4002* (MO); near Madden Dam, *Lewis et al. 5299* (MO). Colón: N side of Madden Dam, *Knapp 2729* (MICH). Darién: Isla Saboga, *Duke 10341, 10365* (MO); Isla Casaya, *Duke 10382* (MO). Panamá: Isla Chitré, *Knapp 3221* (MICH); Isla Chapera, *Knapp 3305* (MO). Without locality: *Duchassaing s.n.* (GOET).

Stigmaphyllon panamense has large flowers borne on pedicels that are (⅓–) ½ (–⅘) as long as the peduncles. The anthers of the stamens opposite the posterior-lateral petals bear only one reduced locule or rarely are sterile; all anthers are glabrous. The styles all have large folioles; those of the anterior styles are 1.4–2.1 mm long and wide, and those of the posterior styles are 1.9–2.8 mm long and wide. The lower leaf surfaces are sericeous or bear short-stalked T-shaped hairs; the pubescence is sloughed off in patches, and old leaves may be glabrate below.

This species was reported by Johnston (1949) and by Cuatrecasas and Croat (1980) as *S. lindenianum*. *Stigmaphyllon lindenianum* differs in its smaller flowers on pedicels that usually are shorter than the peduncles. All anthers bear two locules and are pubescent. The folioles are smaller, up to 1 mm long and 1.1 mm wide in the anterior style, and up to 1.3 (–1.7) mm long and 1.5 (–1.7) mm wide in the posterior ones. The leaves are sericeous below with the hairs evenly distributed or sparsely so but are never glabrous.

Stigmaphyllon pseudopuberum Nied., Verz. Vorles. Ak. Braunsberg W.-S. 1912–1913: 28. 1913.—TYPE: GUATEMALA. Alta Verapaz: Coban, Nov 1902, *von Türckheim 8385* (lectotype, here designated: US!; isolectotypes: A! F! GH! M! NY! US!).

Laminas 6–15 cm long, 3.5–12 cm wide, ovate to elliptical or broadly so or sometimes lanceolate, apex acuminate-mucronate, base attenuate to truncate or sometimes slightly cordate, glabrous above, sericeous to densely so below, margin with sessile glands, basal glands prominent to stoutly stalked (pegshaped), each 0.6–2 mm in diameter, up to 1.3 mm high; petioles 1–6.3 cm long; stipules triangular to linear, eglandular. Flowers ca 12–20 per congested pseudoraceme, these borne in dichasia or small thyrses, rarely solitary. Peduncles 3–9 mm long, pedicels 2.5–9.5 mm long, terete, peduncles ⅕–1⅘ times as long as pedicels; bracts 0.8–1.8 mm long, triangular or narrowly so, bracteoles 0.9–1.5 mm long, triangular or broadly so, eglandular. Limb of anterior-lateral petals ca 5.5–7 mm long and wide, limb of posterior-lateral petals ca 4–5.5 mm long and wide, limb of posterior petal ca 3.5–5 mm long and wide, all orbicular, margin erose or erose-dentate, teeth up to 0.3 (–0.4) mm long. Stamens equal in shape, that opposite the anterior style usually the longest or those opposite the anterior-lateral sepals equally long; anthers equal in shape, subequal in size, glabrous. Anterior style 1.3–2.1 mm long, slightly shorter than or equal to the posterior two, glabrous; apex 0.7–0.9 (–1.2) mm long including a spur up to 0.2 mm long, linear, 0.2–0.3 (–0.4) mm wide, folioles absent. Posterior styles 1.6–2.4 mm long, glabrous, erect; apex 0.8–1.3 mm long including a spur up to 0.2 (–0.3) mm long or blunt, linear, 0.3–0.4 (–0.5) mm wide, folioles absent. Dorsal wing of samara 4–5.4 cm long, 1.5–2.3 cm wide, upper margin with a tooth; nut bearing 1–3 lateral winglets on each side or only 1–2 spurs and/or crests or with a network of prominent ribs up to 0.5 mm high; embryo ovoid, ca two times as long as wide.

Phenology. Collected in flower from May through February, in fruit from September through May and in July.

Distribution. Chiapas, Mexico, and Huehuetenango, Quetzaltenango, Suchitepéquez, and Alta Verapaz, Guatemala; upper elevation pine-oak forest and montane rain forest; (1000–) 1300–2700 m.

REPRESENTATIVE SPECIMENS. MEXICO. Chiapas: Mpio Zinacantán, along Mex. Hwy at paraje Sequentic, *Breedlove 10395* (DS, F, MICH, US, UTD); Mpio Jitotol, 6.5 km N of Jitotol along road to Pichucalco, *Breedlove 21417* (DS, ENCB, MICH, MO, NY); Mt. Male, near Porvenir, *Matuda 4588* (A, F, MEXU, MO, NY, US); Mt. Ovando, *Matuda 2661* (A, DS, F, MEXU, MICH, NY, US, UTD); Mpio La Trinitaria, Lagos de Montebello, E side of Lago Tsikaw, *Shilom Ton 2643* (DS, ENCB, MICH, NY).—GUATEMALA. Alta Verapaz: Pansamalá, *von Türckheim 708* (GH, NY, P, US). Huehuetenango: near Jacaltenango, *Steyermark 51840* (F, US). Quetzaltenango: Chiquihuite, *Standley 68103* (F). Suchitepéquez: flood plain of Río Mocá, *Skutch 1578* (A, F, US).

Stigmaphyllon pseudopuberum is the only other species in our area besides the coastal *S. ovatum* in which the stamens and the styles are subequal. The styles are efoliolate; the anterior one always has a tiny spur, and the posterior styles may also have such a spur or be blunt. The small flowers are borne in crowded compound inflorescences.

This distinctive species has sometimes been confused with *S. puberum*, because they both commonly have elliptical to lanceolate laminas; neither species has cordate leaf blades, which are more common in the genus. In *S. pseudopuberum* the laminas are sericeous to often very densely so below; in *S. puberum* they are sericeous to sparsely so below. *Stigmaphyllon puberum* is easily separated by its flowers and samaras. The petals are fimbriate rather than erose or erose-dentate, and the stamens and the foliolate styles are unequal. In *S. pseudopuberum* the samara has a large, flaring dorsal wing; that of *S. puberum* has the dorsal wing encircling the nut and tapering distally. The two species are not sympatric. *Stigmaphyllon pseudopuberum* is an upland species, while *S. puberum* has not been recorded from elevations above 500 m.

Stigmaphyllon puberum (Rich.) Adr. Juss., Ann. Sci. Nat. Bot., sér. 2, 13: 289. 1840. *Banisteria pubera* Rich., Actes Soc. Hist. Nat. Paris 1: 109. 1792.—TYPE: FRENCH GUIANA. *LeBlond 44* (holotype: G!).

Stigmaphyllon puberum β *schomburgkianum* Bentham, London J. Bot. 7: 129. 1848.—TYPE: GUYANA. *Rob. Schomburgk 2nd. coll. 819* (*1500*) (holotype: K!; isotype: G!).

Laminas 8.2–20.2 cm long, (2–) 3–12.5 cm wide, commonly lanceolate or narrowly so (rarely linear-lanceolate) to elliptical to ovate to sometimes suborbicular, apex acuminate, base attenuate or truncate or sometimes cordate, glabrate or glabrous above, sericeous to sparsely so below, margin with scattered sessile glands, basal glands prominent, sessile, each 1–1.8 (–2.2) mm in diameter; petioles 1.2–7.2 cm long; stipules triangular to linear, eglandular. Flowers 8–15 per umbel, these born in dichasia or small thyrses, rarely solitary. Peduncles (0.8–) 1.5–4.8 mm long, pedicels 2.5–7.5 mm long, terete, peduncles ⅕–⅚ as long as the pedicels or rarely subequal; bracts 1.1–2.2 mm long, triangular or broadly so, bracteoles 0.8–1.4 mm long, broadly triangular to ovate or parabolic, eglandular. Limb of anterior-lateral petals ca 8–13 mm long and wide, limb of posterior-lateral petals ca 7–8.5 mm long and wide, all orbicular, margin with fimbriae up to 0.6 (–0.8) mm long; limb of posterior petal ca 5–7 mm long, 4.5–6.5 mm wide, orbicular to broadly obovate or sometimes almost square, margin with fimbriae up to 0.6 mm long. Stamens unequal, that opposite the anterior style the largest, those opposite the anterior-lateral sepals with the connective enlarged and the locules reduced; anthers glabrous. Anterior style 3.5–4.6 mm long, longer than the posterior two, glabrous or sometimes with scattered hairs in the proximal half; apex (1–) 1.2–1.8 mm long including a spur 0.1–0.3 mm long, each foliole (0.7–) 1–1.8 mm long, (0.6–) 1–1.5 (–1.7) mm wide, commonly narrowly trapezoidal or rectangular to subsquare. Posterior styles 2.5–3.3 (–3.5) mm long, glabrous or sometimes with scattered hairs in the proximal third, lyrate; folioles 0.9–1.5 mm long, 0.6–1.1 mm wide, rectangular to rhombic or sometimes triangular. Dorsal wing of samara 2.6–3.7 cm long, 0.9–1.5 cm wide, tapering from the nut and encircling it; nut smooth or sometimes with 1–5 prominent ribs; embryo ovoid, ca two times as long as wide.

Phenology. Collected in flower and fruit throughout the year.

Distribution. In Central America in the Atlantic lowlands and also in the Pacific lowlands of Costa Rica (Golfo Dulce area) and Panama, lowlands of northern South America, in the West Indies recorded from Jamaica (very rare, fide Adams, 1972), the Dominican Republic, Puerto Rico, Guadeloupe, Désiderade, Martinique, Dominica, and St. Vincent; in wet areas: rain forests, gallery forests, river banks, and mangrove swamps; sea level to 500 m.

Representative Specimens. Jamaica. *McNab s.n.* (GOET).—Dominican Republic. Santo Domingo, Llano Costero, *Ekman H12508* (F, G, MICH, NY, S, US); prov. Samaná, Sánchez, in the Gran Estero, *Ekman 14796* (S).—Puerto Rico. Colonía Paraíso, *Liogier et al. 30076* (NY, UPR); at KM 28.1 on rte 191 near Florída, *Wagner 1643* (A, U mixed with *S. emarginatum*).—Guadeloupe. *Duss 2414* (F, MO, NY, US); *Stehlé 410* (P, S, US).—Dominica. *Eggers 651* (BR, G, GH, GOET, M, P, W); *Hodge 554* (GH, NY); *Howard 11761* (A, NY).—Martinique. *Duss 1472* (F, GH, MO, US); *Hahn 1132* (BR, G, P, W); *Stehlé & Stehlé 4506* (US).—St. Vincent. *Smith & Smith 1261* (NY).—Belize. Toledo: Monkey River, *Gentle 3567* (MICH, MO, NY, U, US, UTD); "El Dorado," Punta Gorda, *Schipp 1009* (A, CAS, F, G, GH, MICH, MO, NY, S).—Guatemala. Izabal: S of Río Dulce, *LeDoux et al. 2094* (CAS, LL, MEXU, MICH, MO, NY, WIS); vic. of Quiriguá, *Standley 24059* (GH, NY, US). Petén: Cadenas, *Contreras 9155* (LL, MICH, UTD).—Honduras. Atlántida: between Tela and Lancetilla, *Yuncker 4577* (A, F, MICH); vic. of La Ceiba, along Río Danto, slopes of Mt. Cangrejal, *Yuncker et al. 8434* (F, G, GH, MICH, MO, NY, S, US). Cortés: Golfo de Honduras, 2 mi W of Omoa, *Webster et al. 12715* (F, MO).—Nicaragua. Río San Juan: Río Indio, 5 hrs upriver from San Juan del Norte, 11°07′N, 83°50–52′W, *Riviere 242* (MO). Zelaya: Isla del Maíz Grande, *Martínez S. 1696* (MICH); Río Chiquito, Caño Dos Oros, a 5–7 km al N de Atlanta, *Téllez et al. 4950* (MO).—Costa Rica. Heredia: Finca La Selva, OTS Field Station, Rio Viejo just E of its junction with the Río Sarapiquí, *Hammel 9325* (DUKE); near Puerto Viejo de Sarapiquí, *Murray & Johnson 881* (MICH). Limón: ca 1 km N of Cahuita, *Almeda 3245* (CAS, MICH); banks of the Río Colorado, *Morley 803* (F, GH, MO, US); northern outskirts of Cahuita, ca 47 km S of Limón, *Wilbur et al. 23362* (MICH, DUKE). Puntarenas: Golfito de Osa, *Brenes 12292* (*no. 75 of the Porsch Expedition*) (F, W); Corcovado Natl Park, 0–2 km W of park headquarters at Sirena, 8°29′N, 83°36′W, *Liesner 2910* (MO); Santo Domingo de Golfo Dulce, *Tonduz 6985* (F, GH, MICH, US), *9942* (BR, P).—Panama. Bocas del Toro: Río San Pedro, *Gordon 84C* (MO); Water Valley, *von Wedel 2662* (GH, MO, NY); vic. of Chiriquí Lagoon, *von Wedel 2761* (GH, MO, NY). Canal Zone: Juan Mina, *Bartlett & Lasser 16510* (MICH, MO); near Gamboa, *Clewell & Tyson 3267* (MO); Barro Colorado Island, *Bangham 496* (A, F, S), *Foster 1033* (F, DUKE). Colón: Coclé del Norte, *Hammel 4583* (MICH); Quebrada Santa Marta, on coast rd, 4.5 km SW of PINA, *Nee 11716* (MICH, MO); N of Río Guanche, *Davidse & D'Arcy 10070* (MO, NY). Darién: Río Ucunguantí, *Bristan 1154* (MO); Río Tuira, between Río Purnusa and Río Mangle, *Duke 14611* (MO); Ensenada del Guayabo, 16–19 km SE of Jaqué, *Garwood 987* (MICH). Panamá: Río Mamoni, below La Caitana, *Pittier 4580* (F, GH, S). San Blas: Mulatuppu, Río Ibadi, *Duke 8474* (MO); mainland opposite Playon Chico, *Gentry 6408* (MICH); Ailigandí, *Hammel & D'Arcy 4965* (MO).

In *S. puberum,* as in *S. hypargyreum,* the anterior style and its opposing stamen are larger than the posterior styles and their opposing stamens. In all other species in our area, the posterior styles and their stamens exceed or at least are equal to the anterior style and stamen. *Stigmaphyllon puberum* also differs from most species in its leaves, which are commonly lanceolate and always acuminate. The petals are fimbriate. The samara is unusual in that the dorsal wing encircles the nut and tapers distally. In flower *S. puberum* might be confused with *S. hypargyreum,* but in that species the laminas are so densely silvery sericeous below that the epidermis is obscured, and the petals are erose to denticulate or if fimbriate with fimbriae only up to 0.2 (–0.3) mm rather than 0.6 (–0.8) mm long.

Stigmaphyllon retusum Griseb. in Oersted, Vidensk. Meddel. Dansk. Naturhist. Foren. Kjobenhavn 1853(1–2): 45. 1854.—Type: Nicaragua. "Prope Granada," *Oersted s.n.* (lectotype, here designated: GOET!; isolectotype: C!).

Stigmaphyllon lupulus S. Watson, Proc. Amer. Acad. Arts 21: 461. 1886. *Stigmaphyllon lindenianum* var. β. *lupulus* (S. Watson) Nied., Ind. Lect. Lyc. Brunsbergi p. aest. 1900: 19. 1900. *Stigmaphyllon lindenianum* subsp. *lupulus* var. γ. *watsonianum* Nied., Pflanzenreich IV. 141(2): 499. 1928, nom. superfl.—TYPE: GUATEMALA. Izabal: Chocón, 21 Mar 1885, *Watson 35* (holotype: GH!).

Stigmaphyllon lindenianum var. γ. *nicaraguense* Nied., Ind. Lect. Lyc. Brunsbergi p. aest. 1900: 19. 1900.—TYPE: NICARAGUA. *Wright s.n.* (holotype: B, destroyed; isotypes: GH! GOET! US!).

Laminas 7–18 cm long, 5–15 cm wide, triangular to cordate to ovate to elliptical or sometimes 3(–5)-lobed or rarely suborbicular, apex mucronate or acuminate-mucronate, base cordate or sometimes truncate, glabrate to glabrous above, with T-shaped hairs and/or tomentose below, margin with scattered sessile glands and sometimes also with scattered filiform glands up to 2.5 (–5.5) mm long, basal glands prominent, sessile, each 1.2–2.7 mm in diameter; petioles 1.6–9.5 cm long; stipules triangular, eglandular. Flowers 15–35 (–40) per umbel or corymb, these borne in dichasia or compound dichasia or small thyrses, rarely solitary. Peduncles 2.5–8.5 (–10) mm long, pedicels 4–10 mm long, terete, peduncles ½ as long as to subequal to the pedicels; bracts 0.8–2.1 mm long, triangular to narrowly so, bracteoles 0.5–1.5 (–1.8) mm long, triangular to parabolic to oblong to subsquare, eglandular. Limb of anterior-lateral petals 7–13.5 mm long, 7–12 mm wide, limb of posterior-lateral petals ca 5.5–11 mm long, ca 5–10.5 mm wide, all orbicular to broadly obovate, margin erose or denticulate or denticulate-fimbriate or with fimbriae up to 0.3 mm long; limb of posterior petal 5.5–9.5 mm long, 4.5–7 mm wide, broadly elliptical to obovate to suborbicular, margin denticulate or denticulate-fimbriate or with fimbriae up to 0.3 (–0.4) mm long. Stamens unequal, those opposite the posterior styles the largest, those opposite the anterior-lateral sepals sometimes equally long, those opposite the lateral sepals with the connective enlarged and the locules reduced (sometimes only slightly reduced in stamens opposite the anterior-lateral sepals); anthers pubescent. Anterior style 1.8–3 mm long, shorter than the posterior two or sometimes almost as long, glabrous; apex 0.8–1.5 mm long, each foliole 0.5–1.6 mm long and wide, parabolic to rectangular to square, folioles rarely unequal, rarely one or both folioles reduced and the apex merely expanded, ca 0.6 mm wide. Posterior styles 2.4–3.8 (–4) mm long, glabrous, lyrate; folioles (0.7–) 1–2.5 mm long and wide, square to subrectangular. Dorsal wing of samara 2.5–4.5 (–4.8) cm long, 1–1.5 (–1.8) cm wide, upper margin with a tooth; nut with a pair of lateral winglets and/or bearing spurs and/or crests or only prominently ribbed; embryo ovoid, ca two times as long as wide. Fig. 5a–h.

Phenology. Collected in flower and fruit throughout the year.

Distribution. Southeastern Mexico to Nicaragua; in rain, evergreen, gallery, and scrub forests, in acahuales and matorrales, along rivers, in thickets, and at roadsides; sea level to 1100 m.

REPRESENTATIVE SPECIMENS. MEXICO. Chiapas: Mpio Palenque, 3–5 km N of Palenque along rd to Villahermosa, *Breedlove 26648* (DS, MEXU, MO); Mpio La Independencia, valley of Santa Elena along rd to Ixcan, *Breedlove 41958* (DS, MEXU, MICH); Mpio La Libertad, 10 km towards Chancala on rd to Bonampak, *Breedlove 57845* (CAS). Oaxaca: Cerro Blanco, Teotitlán, *Conzatti 3437* (MEXU, US); Tuxtepec, Chiltepec, *Martínez Calderón 45* (CAS, CHAPA, ENCB, NY, TEX). Puebla: 5 km adelante de Ceiba Grande, orillas del Río Cazones, *Riba 422B* (ENCB); adelante de

Agua Fría, *Sarukhan et al. 3250* (MEXU). San Luis Potosí: Tamazunchale, *Fisher 3784* (GH, MO, NY, US); Mpio Valles, 1 km N of la Estribera, *Fryxell & Anderson 3522* (MICH); near Tamasopo, *Pringle 4102* (BR, F, G, GH, GOET, LL, M, MEXU, MICH, MO, MSC, NY, P, US, W). Veracruz: Mpio Cosamaloapan, Otatitlán, *Martínez C. 1060* (CAS, ENCB, F, GH, MEXU, MO, NY); Atoyac, *Matuda 1482* (MEXU, MICH, MO, NY, US); Mpio Martínez de la Torre, San Carlos, *Ventura A. 1296* (DS, ENCB, F, MICH, MO).—Belize. El Cayo: Vaca, *Gentle 2490A* (MEXU, MICH, NY, UTD). Toledo: near Jacinto Hills, *Gentle 5525* (LL, MICH, UTD).—Guatemala. Alta Verapaz: Chahal, on Sebol rd, *Contreras 7759* (LL, MICH, UTD); SW of Lanquín, *Steyermark 44074* (F, GH). Chiquimula: 2 km from Esquipulas, *Molina R. & Molina 25197* (F, NY, US). Izabal: Cienaga, on Petén-Guatemala rd, *Contreras 10825* (LL, MEXU, MO, S, US, UTD); 12 km N of Río Dulce on rd to Modesto Méndez, *Harmon 2487* (F, MICH, MO). Jutiapa: near El Molina (dept. Santa Rosa), *Standley 78475* (F). Petén: KM 158 on Cadenas rd, *Contreras 6559* (LL, MICH, UTD). Retalhuleu: vic. of Retalhuleu, *Standley 88789* (F). Santa Rosa: about Guazacapán, *Standley 78593* (F).—Honduras. Comayagua: vic. of Siguatepeque, *Standley & Chacón 6906* (F). Gracias a Dios: Río Plátano, *Gentry et al. 7522* (F, MO). Morazán: drainage of Río Yeguare, 14°N, 87°W, faldas del Cerro Majicarán, *Molina R. 1756* (F, MO). Olancho: camino a San Francisco La Paz, matorral del Río Telica, *Molina R. 13362* (F, NY).—El Salvador. Ahuachapán: vic. of Ahuachapán, *Standley 20347* (GH, NY, US). San Salvador: vic. of San Salvador, *Standley 19643* (GH, NY, US). San Vicente: vic. of San Vicente, *Standley 21272* (GH, NY, US).—Nicaragua. Boaco: Camouapa, *Atwood 3513* (F, GH, NY). Carazo: Río Grande, ca 4 km al N del balneario de Casares, *Grijalva & Vanegas 3416* (MICH). Chinandega: Chinandega, *Baker 2026* (A, F, G, GH, MO, MSC, NY, P, US, W). Chontales: Hacienda San Martín, near confluence of Río El Jordán and Río La Pradera, 12°17′N, 85°15′W, *Stevens 22858* (MICH). Estelí: 3–7 km NW of Pueblo Nuevo, *Williams & Molina R. 42391* (F, MICH, US). Granada: Volcán Mombacho, 1.3 km antes de Hacienda Cutirre, "El Cacao," 11°51′N, 85°57′W, *Moreno 6326* (MICH). Jinotega: al NE de Wiwilí, camino entre Carmen y Wamblán, ca 1 km al N del Carmen, 13°43′N, 85°46′W, *Araquistain & Moreno 1505* (MICH). León: Volcán Momotombo, alrededores del Proyecto Geotermico, *Araquistain & Moreno 1083* (MICH). Madriz: a 10.5 km al S de Somoto, carretera Panamericana, en el valle de Yalaguina, 13°30′N, 86°30′W, *Moreno 5992* (MICH). Managua: ca 5 km NNW of Hwy 12 along rd on ridge of Sierra de Mateare, ca 12°07′N, 86°23′W, *Stevens 6198* (MICH). Matagalpa: along Río Las Cañas, 10–15 km NE of Matagalpa, *Williams et al. 24020* (F, NY). Masaya: a orillas de la Laguna Masaya, 11°58′N, 86°08′W, *Moreno 6137* (MICH). Nueva Segovia: El Jícaro "Casas Viejas," 13°45′N, 86°06′W, *Moreno 5716* (MICH). Rivas: Isla Ometepe, Volcán Concepción, poblado La Esperanza, 11°31′N, 85°37′W, *Robleto 1613* (MICH). San Juan del Norte: "El Carmen," 2 km al N de San Miguelito, 11°25′N, 84°53′W, *Moreno 23468* (MO). Zelaya: along new rd to Mina Nueva America, leading ca W from 14.3 km N of El Empalme on main rd to Rosita, *Stevens 12705* (MICH).

Stigmaphyllon retusum is a widespread, highly polymorphic species, whose stem and leaf vesture is composed of T-shaped hairs and whose anthers are pubescent. The leaves vary from triangular to cordate to ovate to elliptical or sometimes are 3–5-lobed or rarely suborbicular. The name *S. retusum* has never been taken up, and these plants have usually been reported as *S. lindenianum* and *S. humboldtianum*. In *S. lindenianum* the leaves are always sericeous or sparsely so below. *Stigmaphyllon humboldtianum* has glabrous anthers and occurs in our area only in Darién, Panama.

Plants from Veracruz and adjacent San Luis Potosí, Puebla, and Oaxaca, Mexico, are most similar to those from southern Guatemala to Nicaragua. The limbs of the lateral petals are 6.5–9.5 mm long, and the limb of the posterior petals is ca 6–8 mm long. The folioles of the anterior style are 0.5–1.5 mm long and 0.5–1.2 mm wide, and are inserted at about the center of the apex of the style. The folioles of the posterior styles are ca 1–1.6 mm long and ca 1–1.9 mm wide. Flowers of the Mexican plants tend to be at the larger end of the range of these measurements and those of the southern plants at the smaller end. In the Mexican specimens the hairs on the branches and petioles tend to be stiffer and have slightly longer stalks, 0.2–0.3 (–0.4) mm long, than those of the southern Guatemalan to Nicaraguan ones in which the stalks are 0.1–0.3 (–0.4) mm long.

The samaras of the Mexican plants have the dorsal wing 2.5–3.1 cm long; the nut commonly bears 2–3 lateral winglets per side or sometimes only crests and/or spurs or is only prominently veined. In samaras from southern Guatemala to Nicaragua the dorsal wing is 3.5–4.5 cm long; the nut usually bears 3–5 lateral winglets per side.

Plants from Chiapas, Mexico, Belize, and northern Guatemala (Petén, Izabal, and Alta Verapaz) are usually larger in most aspects than plants from the rest of the range. The limbs of the lateral petals are 9.5–13.5 mm long and the limb of the posterior petal is 8.5–9.7 mm long. The folioles of the anterior style are usually 1.3–1.7 mm long and 1.1–1.5 mm wide, and are inserted adjacent to the stigma. The folioles of the posterior styles are 2.2–2.5 mm long and 2.1–2.3 mm wide. The hairs tend to be stiff and have a stalk 0.2–0.5 mm long. The samaras have large dorsal wings, 3.5–4.1 (–4.8) cm long, like those of specimens from southern Guatemala to Nicaragua, but the nut usually is prominently ribbed or bears small crests and/or spurs and only infrequently lateral winglets. These plants were recognized by Watson as *S. lupulus* and by Niedenzu as a variety and later as a subspecies. Most of these plants are separable from *S. retusum* from other parts of the range, but the separation is quantitative rather than qualitative and not consistent; they should not be accorded taxonomic status. Individuals with large flowers and/or samaras and/or long-stalked hairs do occur in the northern and more southern part of the range; individuals with smaller flowers and samaras and short-stalked hairs are rare but not absent in the central part (*Breedlove 57845*). Niedenzu also noted this diversity and recognized Nicaraguan plants as a variety of his subsp. *lupulus*.

Stigmaphyllon sagraeanum Adr. Juss., Ann. Sci. Nat. Bot., sér. 2, 13: 290. 1840.

Stigmaphyllon sagraeanum f. I. *typicum* Nied., Pflanzenreich IV. 141(2): 482. 1928.—TYPE: CUBA. *de la Sagra s.n.* (holotype: P–JU!).

Stigmaphyllon reticulatum Adr. Juss., Ann. Sci. Nat. Bot., sér. 2, 13: 290. 1840. *Stigmaphyllon sagraeanum* f. 2. *reticulatum* (Adr. Juss.) Nied., Ind. Lect. Lyc. Brunsberg. p. hiem. 1899–1900: 11. 1899.—TYPE: CUBA. *de la Sagra s.n.* (lectotype, here designated: P–JU!).

Stigmaphyllon obtusum Turcz., Bull. Imp. Soc. Naturalistes Moscou 35: 583. 1863.—TYPE: CUBA. *de la Sagra s.n.* (holotype: CW?).

Stigmaphyllon faustinum Wright in Sauv., Anales Acad. Ci. Méd. Habana 5: 244. 1868. *Stigmaphyllon sagraeanum* f. 4. *faustinum* (Wright in Sauv.) Nied., Ind. Lect. Lyc. Brunsberg. p. hiem. 1899–1900: 11. 1899.—TYPE: CUBA. *Wright 3522* (holotype: HAB?; isotypes: NY! US!).

Stigmaphyllon sagraeanum f. 3. *wrightianum* Nied., Ind. Lect. Lyc. Brunsberg. p. hiem. 1899–1900: 11. 1899.—TYPE: CUBA. *Wright 2154 p.p.* (holotype: B, destroyed; isotype: G!).

Stigmaphyllon sagraeanum f. 5. *primaevum* Nied., Verz. Vorles. Ak. Braunsberg W.-S. 1912–1913: 26. 1912.—TYPE: CUBA. Pinar del Río, *Baker & Abarca 3699* (*Herb. Est. Centr. Agr.*) (holotype: B, destroyed; isotype: NY!).

Stigmaphyllon coccolobaefolium Alain, Phytologia 8: 369. 1962.—TYPE: CUBA. Oriente: Vía Sur, near Yateritas, on coastal rocks, 10 Jan 1956, *Alain & Morton 4955* (holotype: NY!; isotypes: LS, SV, fide Alain).

Stigmaphyllon nipense Alain, Bull. Torrey Bot. Club 90: 188. 1963.—TYPE: CUBA. Oriente: Sierra de Nipe, in charrascales, 300–400 m, 7 Jan 1956, *Morton et al. 8784* (holotype: US!).

Laminas (1–) 2.9–13 cm long, 0.2–7 cm wide, linear to oblong to lanceolate to elliptical to suborbicular, apex mucronate or mucronate-emarginate, base truncate or slightly cordate, glabrate to glabrous above and below, margin eglandular, basal glands usually stipitate and up to 1 (–2) mm long or sometimes subsessile, each 0.2–1 mm in diameter, or sometimes one or both glands absent; petioles (1.6–) 2.2–6 cm long; stipules narrowly triangular, eglandular. Flowers (8–) 20–25 (–50) per umbel or pseudoraceme, sometimes a corymb, these solitary or borne in compound dichasia or small thyrses. Peduncles absent to 9 mm long, pedicels (8.5–) 12–27 mm long, terete, peduncles if present always much shorter than the pedicels; bracts (0.6–) 1–2 mm long, narrowly triangular, bracteoles 0.6–1 (–1.4) mm long, narrowly triangular, eglandular. Limb of lateral petals 8–10.5 mm long and wide, limb of posterior petal 6.5–7 mm long and wide, all orbicular or suborbicular, margin erose. Stamens unequal, those opposite the posterior styles the largest, those opposite the lateral sepals with the connective enlarged and the locules reduced, rarely those opposite the posterior-lateral sepals with only one locule or sterile; anthers glabrous. Anterior style (2.6–) 3–3.6 mm long, shorter than the posterior two, glabrous; apex 0.7–0.9 mm long including a spur 0.3–0.5 mm long, linear, 0.3–0.4 mm wide, folioles absent. Posterior styles 3.3–4 mm long, glabrous, lyrate; folioles 0.9–1.3 mm long, 0.4–0.8 mm wide, oblong to parabolic, or sometimes the foliole reduced to a narrow lip, or rarely absent and apex ca 1 mm long including a spur 0.3–0.4 mm long, linear, ca 0.2 mm wide. Dorsal wing of samara 1.8–2.4 cm long, 0.7–1.5 cm wide, upper margin with a tooth; nut with prominent veins; mature seed not seen.

Phenology. Collected in flower and fruit throughout the year.

Distribution. Cuba and the Bahamas; on limestone and serpentine outcrops, in coastal thickets, open savannas, and pastures; sea level to 1200 m.

Representative Specimens. Bahamas. Andros Island: *Correll & Godfrey 41259* (LL, MO, NY); *Small & Carter 8441* (F, NY); *Wight 236* (F, GH, NY). Eleuthera: *Correll & Hill 45231* (NY). Long Island: *Britton & Millspaugh 6232* (F, NY); *Correll 44863, 48173* (NY). Rum Cay: *Gillis 6240, 6262* (MSC).—Cuba. Camagüey: 6 mi NW of Cayo Coco, *Shafer 2692* (NY, US); La Gloria, *Shafer 176* (NY, US); Atalaya, *Shafer 979* (NY); S of Sierra Cubitas, *Shafer 497* (NY). Havana: vic. of Cojimar, *Britton et al. 6230* (NY); San Antonio, *van Hermann 834* (F); El Morro to Cojimar, *Wilson 9133* (NY); Havana, *Shafer 542* (CM, NY); Isla de Pinos, *Curtiss 213* (A, CM, F, G, M, MO, NY); *Jennings 1* (NY), *33* (NY), *520* (CM); *Killip 41660* (GH), *43560* (P), *43599* (GH); *Millspaugh 1419* (F). Mantanzas: vic. of Mantanzas, gorge of the Yumuri, *Britton et al. 496* (CM, F, NY); Mantanzas, *Rugel 157* (GH, MO, NY), *Britton et al. 71* (CM, NY), *Ekman 17212* (A, S). Oriente: Río Macaguanigua, *Shafer 3937* (NY, US); Gibara, *Pollard et al. 5* (A, CM, F, GH, MO, NY, US); valley of Río Bayamita, S slope of Sierra Maestra, *Maxon 3912* (F, GH, MO, NY, US); Baracoa, *Underwood & Earle 1353* (NY); Punta Piedra, Nipe Bay, *Britton et al. 12454* (NY, US); Bayate, Sabana Resueña, *Ekman 2819* (NY, S). Pinar del Río: Bahía Honda, *Wilson 9418* (NY, U); Sierra de Anafe, *Wilson 11431* (NY); Buenaventura to San Juan de Guacamalla, *Wilson 9321* (NY); Laguna Jovero to Las Martinas, *Shafer 11034* (F, MO, NY). Las Villas: 12 km E of Cascajal, *Howard 5586* (GH, NY); Río Toyaba, Trinidad, *Britton et al. 5550* (NY); Trinidad, La Viga hill, *Britton & Wilson 5530* (NY); Río San Juan, *Britton et al. 5883* (NY). Without locality: *Wright 97* (BR, G, GH, GOET, LE, MO, NY, P, S, W).

In *S. sagraeanum,* as in the West Indian *S. diversifolium* and *S. emarginatum,* the laminas vary from linear to suborbicular; most commonly they are elliptical to broadly linear-oblong and are rugose and glabrous. The basal leaf glands are usually peg- or sometimes nail-like. The peduncles are always much shorter than the pedicels or sometimes absent.

Stigmaphyllon sagraeanum is the only species in the West Indies in which the anterior style lacks folioles but the posterior styles bear them; however, the size

of the folioles is variable. In the majority of specimens the folioles are broadly oblong to parabolic, but in a number of individuals the folioles are reduced and narrowly triangular or may be represented only by a lip. A collection from the province of Havana (*van Hermann 834*) even has a flower in which one posterior style has a large foliole and the other one only a tiny flap. In some specimens, from various parts of Cuba, the posterior styles lack folioles. The styles are efoliolate and subequal in all collections seen from the Sierra de Nipe (Oriente) and in all but two from the Isla de Pinos; the posterior styles of the two exceptions (*Jennings 1, 33;* both NY) have large folioles. This extreme reduction was recognized as f. *primaevum* by Niedenzu, who considered the efoliolate condition ancestral. Such variability and even loss of the foliole is also known in other species. Because the degree of reduction is greatly variable, and because it is the only character in which these individuals differ from the typical representatives of *S. sagraeanum,* these plants are not recognized taxonomically here. Future work with living plants may reveal that the loss of the folioles is genetically fixed and should be accorded varietal or even specific status.

Stigmaphyllon selerianum Nied., Ind. Lect. Lyc. Brunsberg. p. aest. 1900: 7. 1900.—TYPE: MEXICO. Oaxaca: Distr. Nochixtlán, Almoloyas, 15 Nov 1895, *Seler & Seler 1374* (holotype: B, destroyed, fragment: NY!, photos: A! F! MICH! NY!).

Laminas 4–17.5 cm long, 3–15 cm wide, cordate or narrowly so, apex mucronate or emarginate-mucronate, base auriculate, glabrous above, sparsely sericeous to glabrate below, margin with cilia up to 0.8 mm long, basal glands prominent, sessile, each 1–2.8 mm in diameter; petioles 1.5–7 cm long; stipules triangular or sometimes oblong, eglandular. Flowers 8–12 per umbel or corymb or sometimes a pseudoraceme, these solitary or borne in dichasia or rarely in small thyrses. Peduncles 0.5–3 mm long, pedicels 6.5–11.5 mm long, terete, peduncles up to ⅓ as long as pedicels; bracts 1–2 mm long, broadly triangular, bracteoles 0.9–1.9 mm long, broadly triangular, eglandular. Limb of anterior-lateral petals ca 11.5–13 mm long, ca 10–13 mm wide, limb of posterior-lateral petals 8.5–11.5 mm long and wide, all broadly elliptical to orbicular, margin erose; limb of posterior petal 8.5–9.5 mm long, 7–8.5 mm wide, broadly elliptical or broadly obovate to sometimes orbicular, margin erose or denticulate-fimbriate, teeth and fimbriae up to 0.5 mm long. Stamens unequal, those opposite the posterior styles the largest, those opposite the lateral sepals sometimes with the connective enlarged and the locules reduced; anthers glabrous or the largest sometimes with scattered hairs. Anterior style 2.5–3 mm long, at least slightly shorter than the posterior two, glabrous; apex 1.3–1.6 mm long including a spur 0.4–0.8 mm long, linear or elliptically to obovately expanded distally, folioles absent. Posterior styles 2.8–3.5 mm long, glabrous, lyrate; apex 1.3–1.9 mm long, abaxially laterally expanded into a lip or semielliptical foliole 0.5–1.3 mm wide. Dorsal wing of samara ca 3.5–4 cm long, ca 1.1–1.5 cm wide, upper margin with a tooth; nut smooth or bearing a spur or winglet; mature seed not seen.

Phenology. Collected in flower in June and from September through March, in fruit in December, January, and March.

Distribution. Endemic to Oaxaca and Chiapas, Mexico; in evergreen and tropical deciduous forest, and in thickets on limestone hills; 550–1500 m.

Specimens Examined. Mexico. Chiapas: 11 mi from El Sumidero on road to Tuxtla Gutiérrez, *Anderson & Anderson 5555* (ENCB, MICH); Mpio Tuxtla Gutiérrez, on road to El Sumidero, 8 km N of Tuxtla Gutiérrez, *Breedlove 9027* (DS, F); Mpio Jiquilpas, 20 km N of Jiquilpas and Mex Hwy 190, *Breedlove 24135* (MEXU, MICH, MO, NY, UTD); Mpio La Trinitaria, 18 km S of La Trinitaria on road to Colonia Morelos and Colonia Chihuahua, *Breedlove 46460* (CAS); Mpio Villa Corzo, 32 km from Tuxtla along rd to Nueva Concordia, *Breedlove 48714* (CAS); Mpio Chiapa de Corzo, above El Chorreadero, *Breedlove 50177* (CAS); Trapichito Comitán, *Matuda 5686* (F, MEXU, UTD). Oaxaca: de Almoloyas a Santa Catarina, *Conzatti 1680* (NY, US); Dominguillo, *Miranda 1016* (MEXU); Río de las Vueltas, Dominguillo, *Miranda 4731* (MEXU); Tomellin Canyon, *Pringle 5972* (GH, MICH, US); Nochixtlán, *Quarles van Ufford 348* (U); Jacatlán, *Smith 531* (US).

Stigmaphyllon selerianum is distinguished by the cordate or narrowly cordate leaves, which are fringed with filiform glands. The only other species in our area with ciliate leaves is the coastal *S. ciliatum,* whose leaves are so deeply auriculate that the lobes overlap. It also differs in its larger flowers with foliolate styles, inflated pedicels, and lenticular samaras. In *S. selerianum* the anterior style is efoliolate and the posterior styles have a lateral lip or a small foliole; the pedicels are terete, and the samaras are typical for the genus. *Stigmaphyllon selerianum* is most likely to be confused with *S. cordatum,* an endemic of the highlands of eastern Guatemala; see that species.

Stigmaphyllon tonduzii C. Anderson, sp. nov.—Type: Costa Rica. Guanacaste: Playa Tamarindo, 19 Feb 1985, *Frankie s.n.* (holotype: MICH).

Liana. Laminae 9.5–12 cm longae, 9–12 cm latae, ellipticae vel interdum 3–5-lobatae, supra sericeae vel glabratae, subtus pilos T-formes ferentes, margine glandulosae. Inflorescentia dichasialis vel thyrsiformis constata ex umbellis, floribus in quaque umbella ca 12–20. Pedunculi 3.5–8.5 mm longi; pedicelli 4–7 mm longi. Bracteae 0.8–1.5 mm longae, triangulares; bracteolae 0.8–1.2 mm longae, oblongae vel ovatae, eglandulosae. Petala lateralia orbicularia vel suborbicularia, marginibus erosis; petalum posticum ovatum vel late ellipticum vel orbiculare, margine eroso-denticulata vel eroso-fimbriata. Stamina heteromorpha, omnia fertilia vel antherae petalis postico-lateralibus oppositae raro steriles; antherae glabrae. Stylus anticus 2.6–3.2 mm longus, apice 1.3–1.6 mm longo, utroque foliolo 1.2–1.5 mm longo, 1.4–1.6 mm lato, subquadrato; styli postici 3.3–3.6 mm longi, lyrati, foliolo ca 1.7 (–2.4) mm longo, 1.8–2.3 mm lato, quadrato vel subrectangulari.

Laminas 9.5–12 cm long, 9–12 cm wide, elliptical or sometimes 3–5-lobed, apex acuminate or acuminate-mucronate, base slightly cordate to truncate, sparsely sericeous to glabrate above, with T-shaped hairs to tomentose below, margin with scattered sessile glands, basal glands prominent, sessile, each 1–1.7 mm in diameter; petioles 2–5 cm long; stipules triangular, eglandular. Flowers ca 12–20 per umbel, these borne in dichasia or small thyrses. Peduncles 3.5–8.5 mm long, pedicels 4–7 mm long, terete, peduncles ⅔–1¾ times as long as pedicels; bracts 0.8–1.5 mm long, triangular, bracteoles 0.8–1.2 mm long, oblong or ovate, eglandular. Limb of anterior-lateral petals 10–10.5 mm long and wide, limb of posterior-lateral petals 7.5–9 mm long and wide, all orbicular or suborbicular, margin erose; limb of posterior petal 6.5–8 mm long, 6–7 mm wide, ovate to broadly elliptical to orbicular, margin erose-denticulate or erose-fimbriate, fimbriae up to 0.3 (–0.5) mm long. Stamens unequal, those opposite the posterior styles the largest, sometimes those opposite the anterior-lateral sepals equally

long, those opposite the lateral sepals with the connective enlarged and the locules reduced or those opposite the posterior-lateral sepals with only one locule or sometimes sterile; anthers glabrous. Anterior style 2.6–3.2 mm long, shorter than the posterior two, glabrous; apex 1.3–1.6 mm long, each foliole 1.2–1.5 mm long, 1.4–1.6 mm wide, subsquare. Posterior styles 3.3–3.6 mm long, glabrous, lyrate; folioles ca 1.7 (–2.4) mm long, 1.8–2.3 mm wide, square to subrectangular. Dorsal wing of samara 2.3–3 cm long, 0.7–1 cm wide, upper margin with a tooth; nut smooth or bearing spurs and/or crests; embryo ovoid, ca two times as long as wide. Fig. 6m–o.

Phenology. Collected in flower and fruit in February and in April.

Distribution. Guanacaste (Nicoya peninsula) and eastern Puntarenas, Costa Rica; dry open woods, scrub, and thickets; sea level to ca 100 m.

Additional Specimens Examined. Costa Rica. Guanacaste: Playa Tamarindo, 18 Feb 1985, *Frankie s.n.* (MICH); Nicoya, *Tonduz 13479, 13824* (US); San Isidro, Nicoya, *Tonduz 14008* (US). Puntarenas: Hwy 1 W of San José, KM 135, *Meerow et al. 1003* (SEL).

Stigmaphyllon tonduzii is characterized by elliptical or sometimes lobed leaves that bear T-shaped hairs below and by relatively large flowers with foliolate styles. The anthers are glabrous, and those of the stamens opposite the posterior-lateral sepals are sometimes sterile. This species is most likely to be confused with the variable *S. retusum,* whose range extends from Mexico to Nicaragua, and *S. lindenianum,* which occurs in Costa Rica in the Atlantic lowlands and the Osa Peninsula. Both species have pubescent and always fertile anthers. *Stigmaphyllon lindenianum* also differs in that its leaves are sericeous below. *Stigmaphyllon tonduzii* also resembles *S. humboldtianum,* a species of northern South America that extends into southern Panama. They differ most strikingly in the embryo, which is flattened in *S. humboldtianum* but ovoid in *S. tonduzii.* The samaras are larger in *S. humboldtianum.* The flowers are smaller than those of *S. tonduzii,* with the posterior petal always fimbriate, and are aggregated in clusters of 15–40 (–50). In *S. tonduzii* the margin of the posterior petal varies from erose-denticulate to erose-fimbriate, and the flowers are borne in ca 12–20-flowered umbels.

This species is named for Adolphe Tonduz (1862–1921), who first collected it on the Nicoya peninsula.

EXCLUDED AND DOUBTFUL NAMES

Stigmaphyllon palmatum (Cav.) Adr. Juss., Ann. Sci. Nat. Bot., sér. 2, 13: 288. 1840. *Banisteria palmata* Cav., Diss. 9: 430, *t. 257.* 1790.—Type: "Santo Domingo," *Desportes s.n.* (holotype: P–JU!).

Stigmaphyllon sagittatum (Cav.) Adr. Juss., Ann. Sci. Nat. Bot., sér. 2, 13: 288. 1840. *Banisteria sagittata* Cav., Diss. 9: 430, *t. 257.* 1790.—Type: "Santo Domingo," *Desportes s.n.* (holotype: P–JU!).

These names apply to a South American species that does not occur on Hispaniola or elsewhere in the West Indies. The type specimens were probably collected in French Guiana.

Stigmaphyllon lineare var. *morroensis* Kitanov, God. Sofijsk. Univ. 66: 4. 1974.—Type: Cuba. Oriente: Lomas cerca del Morro, Santiago de Cuba, 24 Aug 1952, *Lopes Figueiras s.n.* (holotype: SV–624, fide Kitanov).

Stigmaphyllon sagraeanum var. *angustiifolium* Kitanov, God. Sofijsk. Univ. 66: 4. 1974.—TYPE: CUBA. Oriente: Matanzas Cuabal del Espinal, Canasi, *Acuña & León 22847* (holotype: SV, fide Kitanov).

Unfortunately, I have not seen the types for these names, which probably apply to narrow-leaved forms of *S. sagraeanum;* the first name may apply to *S. diversifolium.* Only leaf characters are mentioned in the very brief descriptions. Without characterization of the styles and androecium, it is impossible to assign these names to either species.

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APPENDIX

Geographic listing of species of *Stigmaphyllon* by island(s) or country.

Bahamas: *S. sagraeanum.*

Cuba: *S. diversifolium, S. microphyllum, S. ovatum, S. sagraeanum.*

Jamaica: *S. emarginatum, S. ovatum, S. puberum* (very rare).

Hispaniola: *S. angulosum, S. emarginatum, S. laciniatum* (Gonâve Island), *S. ovatum, S. puberum.*

Puerto Rico: *S. emarginatum, S. floribundum, S. ovatum, S. puberum.*

Virgin Islands: *S. emarginatum, S. floribundum* (St. John, Virgin Gorda).

Lesser Antilles: *S. adenodon* (Grenada), *S. ciliatum* (Barbados), *S. convolvulifolium* (Martinique, St. Vincent?), *S. diversifolium* (Anguilla to Martinique), *S. emarginatum* (Anguilla to Martinique except Dominica), *S. ovatum* (Guadeloupe, Martinique, St. Lucia), *S. puberum* (Guadeloupe, Martinique, Dominica, St. Vincent).

Mexico: *S. ellipticum, S. lindenianum, S. ovatum, S. pseudopuberum, S. retusum, S. selerianum.*

Guatemala: *S. ciliatum, S. cordatum, S. ellipticum, S. lindenianum, S. ovatum, S. pseudopuberum, S. puberum, S. retusum.*

Belize: *S. ciliatum, S. ellipticum, S. lindenianum, S. ovatum, S. puberum, S. retusum.*
El Salvador: *S. ellipticum, S. retusum.*
Honduras: *S. ciliatum, S. ellipticum, S. puberum, S. retusum.*
Nicaragua: *S. ciliatum, S. ellipticum, S. lindenianum, S. ovatum, S. puberum, S. retusum.*
Costa Rica: *S. adenophorum, S. columbicum, S. ellipticum, S. lindenianum, S. puberum, S. tonduzii.*
Panama: *S. ellipticum, S. humboldtianum, S. hypargyreum, S. lindenianum, S. ovatum, S. panamense, S. puberum.*